The Builder.

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Technical Education in France.

WE are not about at this moment to enter into any of the numerous ingenious arguments that have been put forth, both for and against the introduction of an extended system of technical instruction amongst our working men. Our present purpose is merely to show what is the extent and the nature of the instruction which the working man of France may get, if he has the mind to seek it. The great French Exhibition of 1867 told us how sharp was the competition of Continental manufacturers with this country. We saw there the wonderful steel-castings of Krupp, and of the Bochum Company in Rhenish Prussia. We found Borsig, of Berlin, sending to Paris his two-thousandth engine of better make than any from French and Belgian factories. Subsequently we heard that M. Schneider, of the Great Creusot works in France, had made a score of engines for our Great Eastern Railway, built from drawings and specifications sent to his workshop from this country. The cry has arisen, and is getting louder and louder still, that the foreigner should be shut out, or at any rate restricted in some way or other, from coming into competition with ourselves, to our manifest detriment. But is such a thing possible at the present time? Can we ever prevent our capitalists from buying in the cheapest market, be that market home or Continental? Whether or not the immense strides made by Continental manufacturers are due to superior education we do not intend here to inquire. This, much, however, we may affirm, that the Continental educational system is preferable to our no-system and rule-of-thumb way of going about the business in hand. And certainly, if a workman has within his breast the high, the laudable desire to excel in his calling, and to improve his condition, we say, without hesitation, that technical education will prove his best and truest friend.

As respects technical education, workmen are constantly being told of the superior advantages enjoyed by the Continental; but hitherto we have not been very fully informed as to the details of the foreign system of teaching. Some information in this direction derived from official sources, will not be out of place.

The Imperial Conservatory of Arts and Trades, or, as it is styled in French, the "Conservatoire des Arts et Métiers" is the oldest establishment for affording technical instruction in France. It owes its origin to a mechanical genius, Vaucanson, who, during his lifetime, was apparently frittering away his talents in contriving complicated pieces of automata, which nevertheless formed the delight of those who had an opportunity of seeing these triumphs of mechanical skill.

Vaucanson constructed, among other things, an automaton flute-player, which executed several airs in a charming way; and a duck which waddled in the water, arranged its plumage, picked up its food, and apparently digested it; together with other ingenious imitations of the natural habits of the bird.

These, however, were but the playthings of a great man, and Vaucanson, while he lived, did much that was of service to his country, and at his death he bequeathed his valuable collection of looms and other machines to the Government, for the free use of artisans, native and foreign. The Government accepted the gift, and placed the collection in a building which was open to all. The collection was enlarged, and just as the great French Revolution burst over France, the institution had become an important aid to the mechanic. During the early tempestuous days of the revolution, the Conservatory was at first neglected, and then shut up. But the period of its vicissitudes was short, and in a very little time the institution resumed its teaching. In 1796 a drawing-school was established. This was an era in the records of technical instruction in France, for until this time no establishment for the teaching of drawing applied to industry, and based upon descriptive geometry, was to be found in the country. From this school, as the Government report assures us, proceeded a number of pupils, who, in various ways became useful to their country, as well as several eminent manufacturers.

In 1810 the Continental blockade, devised by Napoleon to strike a death-blow at English manufacturing industry, was in full operation, and the importation of English cotton goods was almost entirely prevented. This condition of affairs gave rise to the establishment of a spinning-school at the Conservatory. Looms were set up, and a sufficient number of workmen were trained to give an impulse to the weaving trade of France. This school did not long continue in operation; the weavers found employment in private manufactories, after which the establishment was closed as being of a character foreign to the general nature of the Conservatory.

With the exception of this temporary educational workshop, and the elementary drawing-school, the only object of the Conservatory down to this date was the formation of a collection of machines, looms, and apparatus employed in the industrial arts. Its scope was much widened in consequence of a decree of 1819. Prior to this, the Conservatory merely offered to industry a mute museum, from which the manufacturer or artisan might doubtless derive useful instruction; but this instruction was unaccompanied by the teaching of the principles which should form its foundation.

In December of the latter year an important step was taken. There was established a public and gratuitous course of instruction on the application of the sciences to the industrial arts. Here, indeed, was an immense stride, the consequences of which are everywhere to be witnessed in France at the present day. A decree of 1829 added fresh popularity to the Conservatory by the inauguration of a course of physics as applied to the arts. In 1836 three more additions were made. These were,—a course of cultivation, a course of mechanics and buildings applied to agriculture, and a course of agricultural chemistry. There were now seven courses in full operation. But these were still insufficient for the increasing development of industry, as well as for the general demand for more scientific instruction. In prompt obedience to this demand an enlightened French ministry decreed five new public and gratuitous courses. They were,—a course of mechanics applied to industry a course of descriptive geometry, a course of law as applied to industry, a course of chemistry applied to the arts, and a course of agriculture, to which the previously existing course of cultivation was added as a second course. Thus the number of courses was raised to ten. In 1848, a course of ceramics was opened by M. Ebelman, director of the Sèvres Government porcelain manufactory; but at his death the lectures were discontinued. Many improvements were also suggested at this period, but were delayed in consequence of the political condition of France during 1848 and subsequently. The foundation of new courses recommenced in the year 1852 with the establishment, at the instance of the Paris Chamber of Commerce, of a course of spinning and weaving, and a course of dyeing, printing, and dressing of tissues. In the same year a course of zoology applied to agriculture and industry was opened. A course of civil architecture was founded in 1854. At this period, the number of gratuitous public courses in the applied sciences had reached the number of fourteen. But the augmented advantages of the Conservatory were not restricted to oral teaching; the collection of models and machines was enlarged, classified, and in every way improved. Since 1849, a catalogue had been in existence; but now every object exhibited was accompanied by a card explanatory of its use. Projected in 1849, and at the present time in full operation, is a gallery for experiments, and for machines in motion. This department has an important office to perform. It is used for trying, either at the demand of the different ministries, or of private manufacturers, any new machines or apparatus presented for examination. These experiments have been received with great satisfaction, and reports of them have been published by the Conservatory. The experiments are made gratuitously. The Conservatory also undertakes the verification of the standard weights and measures required by those foreign Governments which have adopted the French metrical system.

The collections of models are estimated to be worth 1,300,000 francs, or 52,000*l.* of our money. The library contains 18,000 works on the sciences and industrial arts. In the gallery of drawings there are upwards of 7,000 designs of the newest and most useful machines, to scale, and with dimensions given. There is likewise a collection of expired patents. As early as the Exhibition of 1851, the industrial artists of France were, according to their own confession, alarmed at the strenuous efforts England was beginning to make to dispute with them the empire of taste. From this feeling arose the demand made by the industrial interest for increased facilities in art-teaching. The director of the Conservatory addressed a memorial upon the subject to the Emperor. There are two characteristic paragraphs in this memorial, dated 1854, which we will translate. They show that our indifference to what is going on upon the Continent respecting the teaching of science and art, is not shared by the foreigner, who, as a matter of fact, has been closely watching all our efforts at improvement in technical instruction. The first paragraph says,—"The Universal Exhibition of London has proved to England the superiority of France in the arts dependent on form, taste, and colour. Instead of disputing the fact, the English have set to work at once, with their immense resources and habitual energy, to found museums and drawing-schools all over the country. The Queen and private individuals have stripped their galleries to enrich the museums of practical art with the finest specimens of Sèvres porcelain, bronzes, sculptures, &c."

The second paragraph is still more characteristically French:—"It would seem as if the English were bent on operating on the human species in the way they have upon races of

animals, so as to transform a nation of traders and artisans into a nation of men of taste. How far the Anglo-Saxon race is susceptible of this transformation is a philosophical question beyond my province; but one thing is certain—namely, that a few years hence England will have made immense progress in the arts of design."

To return to the Conservatory. According to the yearly reports addressed to the Minister of Agriculture, Commerce, and Public Works, the number of persons attending the public courses of the Conservatory is constantly increasing. In six months it has reached 180,000 persons. The great amphitheatre of the institution will accommodate 700 persons; the smaller one 300 persons; and both are found too small.

When the courses were first started, Sunday was the day which the public appeared to prefer. Gradually, however, the week-day evenings came into favour.

The teaching so freely given at the Conservatory is exclusively devoted to science applied to industry. The audience is for the most part composed of foremen, workmen who have already received some instruction, and apprentices. There are also a few foreign professors, and many persons who take an interest in the progress of technology. As we have seen, these public courses are gratuitous, and are open to both natives and foreigners. The teaching of this institution is so constantly kept on a level with all the improvements continually being made in France, England, and elsewhere, that the courses are attended by a great number of young foreigners whose intention it is to become professors.

The special influences which this institution brings to bear upon the progress of science applied to industry, may be thus summarised:—The collection of models, machines, and products; lectures on science relating to industry, and upon industrial arts; a gallery of drawings which the public are permitted to copy; and an elementary school. The sum at present voted for its maintenance is 285,500 francs a year.

The Conservatory of Arts and Trades is situate in the Rue Saint Martin, and the visitor to Paris may go over it on any Sunday or Thursday free; on other days he would have to pay a franc.

The Central Imperial School of Arts and Manufactures is a highly esteemed and most important educational establishment, and has been already described at some length in our pages.* By its means many pupils who cannot avail themselves of the opportunities offered by the great Polytechnic School, are enabled to obtain a most complete and practical education.

For the purpose of comparison, we will give a short sketch of the Polytechnic School. It was founded in the year 3 of the Convention (1794), for the instruction of young men in mathematics and drawing for the artillery and engineer corps. None but candidates who can pass a very severe examination in mathematics are admitted. Its effort has always been to educate, above all things, good engineers; and some of the most celebrated military and civil engineers have been bred within its walls. Still, the time required by this school (seven years), including the preparatory and complementary studies, is much too long for candidates who are anxious to commence their practical and money-earning career as soon as possible. The difficult preliminary examination also excludes a great number of candidates. Again, more than half the pupils of the Polytechnic School choose the military service, whilst the greater portion of the other half abandon the civil services to follow scientific pursuits. This is why the admirable Polytechnic School has never been able to satisfy the ever-increasing demands of industry.

The Central School, therefore, fills up a manifest deficiency in the French system of technical instruction. It was founded in 1829 by the celebrated chemist Dumas, assisted by three other gentlemen, without any aid from the Government; but, after some years of success, it first of all passed into the hands of a proprietor, and was then tansferred to the State. In the Central School have been educated a considerable number of able engineers, who have taken high rank as constructors of railways, &c. Many directors, managers, and other functionaries of important industrial establishments, civil engineers, mechanical engineers, architects, &c., have emanated from this school.

The Central School is very popular, even with persons of narrow means, though what in France is held to be a high charge (800 francs, 32*l.*, a year) is demanded from pupils. The Government and several of the departments have founded scholarships in favour of the sons of parents in very humble circumstances, and in some cases money for board and lodging has been added. The sons of rich parents pay for their education, as they naturally ought; whilst the doors of the school are also open for the sons of artisans who have given proof of the talents necessary to profit by the instruction.

At the central school the pupils are compelled, whatever may be the careers they intend to follow, to attend all the courses, and to pass very strict and frequent examinations. During the first year the instruction is purely theoretical. In the second and third years theory and practice are blended. The teaching is not confined to unaided oral instruction; for laboratory experiments, and mineralogical and geological excursions are made use of to complete what the lectures of the professors have commenced. As we have stated, there are frequent compulsory examinations during the courses and at their close, in addition to which there are searching examinations at the termination of each year's studies. The effect of this system is to keep the pupils always up to their work. Discipline is also strictly maintained.

The Central School is quite international and cosmopolitan in its character; pupils of all nations are admitted on the same footing as natives of France. Not a county in Europe is without a representative, and at one time or another pupils have come here from every part of the civilised globe.

There can be no better way of showing what this institution imparts to its scholars than the quoting in full the programme of the three years' studies.

First Year.—Analysis and general mechanics, sixty lessons; general physics, sixty lessons; inorganic and organic chemistry, sixty lessons; theoretical and applied kinematics, twenty-four lessons; construction of machines, twenty lessons; hygienics and applied natural history, twenty lessons; mineralogy and geology, thirty lessons; architecture, ten lessons; industrial drawing, twenty lessons.

Second Year.—Applied mechanics, sixty lessons; strength of materials employed in machines and constructions, twenty-four lessons; construction and mounting of machines, sixty lessons; analytical and industrial chemistry, forty lessons; metallurgy, twenty lessons; civil constructions, sixty lessons; industrial physics, forty-five lessons; industrial and commercial legislation,—ceramics, eight lessons; dyeing, twelve lessons; glass-making and mining, twenty lessons.

Third Year.—Applied mechanics, sixty lessons; construction and erection of machines, fifty-five lessons; analytical chemistry, twenty lessons; industrial and agricultural chemistry, general metallurgy, and metallurgy of iron, sixty lessons. mining, twenty lessons; public works, sixty lessons; steam-engines, thirty-five lessons; railways, forty lessons; naval constructions, twenty-five lessons.

In addition to the above the following practical exercises and studies are required:—

First Year.—Various chemical manipulations; exercises in general physics, stereotomy, and taking of plans; architectural and topographical designs, and working drawings; problems in the infinitesimal calculus, general mechanics, and general physics. During the vacation, after the first year's studies, the pupils are expected to make plans of buildings and machines; also to write an essay on the resistance of materials.

Second Year.—A practical essay on the flow of gases, with the aid of an anemometer and a ventilator; each pupil to draw up a paper on the subject. Construction with bricks according to given plans of various kinds of chimneys, a baker's oven, a lime-kiln, a hot-air stove, &c. Each pupil to make a survey, and draw a plan of a watercourse, and measure the volume of water in a stream; a paper to be sent in on the details of these operations. Practical exercises in a factory on the construction of machines. Twenty-seven manipulations in analyzing and assaying. Drawings and projects of machines and buildings. During the vacation after the second year, the pupils to visit manufactories, &c., and to hand to the director, on resuming their studies, a diary, giving a summary account of the studies made and the factories visited; an album containing notes and sketches made on the spot; fair copies of the most remarkable objects contained in the album, and a paper on questions in applied mechanics.

Third Year.—Projects in two series: the first on the more important subjects in all the courses; the second on subjects connected with machines, buildings, metallurgy, and chemistry.

Such is the profound and comprehensive course of technical education carried out at the Central School. After the Exhibition of 1861, this institution was proposed as an excellent model for the great industrial school which Prince Albert thought of founding in this country. Under the auspices of the prince, a report was drawn up, in which it was alleged that it was indispensable, in order to maintain English industry at the proper height, that an establishment upon this model should be set up in this country. Unfortunately the prince's project has not yet been realised.

The subject will need another paper.

* See p. 400, *ante*.

THE PROPOSED CHANNEL DRIFTWAY AND OUR COMMENTATORS.

A LETTER bearing the not very distinctive signature "Engineer," printed in the *Times* of the 20th inst., in reply to observations in these pages, affords what most disinterested and impartial persons will probably consider to be very weighty testimony in favour of those views as to the doubtful, or at least fabulously costly, project of a tunnel underneath the Straits of Dover, which we intimated, rather than enforced, in our last number.

Let us say at once that in using the term disinterested, we make not the slightest allusion to the possible pecuniary interest of any man, scientific or otherwise, in the scheme. Let professional schemes, once for all, be subjected to the fair course of professional criticism without any approach to an imputation, on either side, of unworthy motives. But there is nothing more likely to bias and swerve the judgment, especially when it is not matured by an adequate amount of experience, than that kind of party spirit which almost invariably springs up on the proposal of any great scheme of a nature altogether novel. That engineer would be almost more than man—he certainly would be no ordinary man—who, when asked if he would undertake the direction of some colossal enterprise, should calmly reply, "All things are within the reach of money; but this which you propose can only be attained by a disproportionate and unjustifiable outlay of money." Thus, let a man, let us say of eminence, be once consulted on a brilliant project, however wild; let some degree of preliminary work be attempted, some degree of preliminary expense incurred, and eager advocacy is sure to be forthcoming. Nor is such advocacy to be regarded, by any impartial judge, in any other light than that under which we criticise the opening speeches of those able men, who, in gowns of silk and of stuff, have learned so much of the language of the civil engineer in the committee-rooms of the Houses of Parliament.

In the present instance the advocacy of "Engineer" is peculiarly *maladroit*. Bearing in mind that the one great engineering difficulty is that of expense, it is certainly rather an Irish mode of procedure to propose to halve the difficulty by doubling the cost. A certain—or rather a very uncertain—amount of the stifling gas known as choke-damp exudes from the surface of freshly-cut chalk. A known amount of the same irrespirable vapour is produced in the lungs of workmen, and by the combustion necessary for illumination. For the greater facility of dealing with this subtle enemy, "Engineer" proposes to *double its quantity*—to double the superficial area of damp chalk, to double the number of workmen, to double the combustion, to double the expense: in a word, "to construct two parallel drift-ways." If the problem had been how to ventilate *at the utmost possible expense*, the suggestion of this plan would have been the proper answer.

It should also be observed that this part of the scheme as it now stands, is irreconcileable with the purpose of "proving the possibility of making the tunnel before 20 per cent. of the necessary capital is expended." Without having before us the plans and sections (if the scheme has advanced so far as the construction of plans and sections), it is impossible to speak with certitude as to the proportionate cost of the driftway and the tunnel respectively. But every one who has any practical experience in such matters knows that the cost is by no means pro-

portioned to the areas, or to the cubic quantities of the larger and smaller bores. A driftway, though costing less per linear yard than a tunnel, costs far more per cubic yard. It is more than questionable whether a driftway of any description could be run under the Straits of Dover for one-fifth of the cost of a tunnel of an area adequate to allow of the passage of a locomotive. It is certain that a pair of parallel driftways could not be constructed for so small a proportion. Some discrepancy in the results of the studies of "the most eminent engineers . . . for many years" here requires explanation.

It is also unfavourable to the upshot of those studies that "Engineer" speaks of the commencement of the driftway in the tone,—or at all events illustrated by the analogy,—of a six months' tour. The projector has not made up his mind whether to use a great coat or an umbrella to keep out the tide. Whether his two parallel driftways shall be timbered, or bricked, or iron-lined, is to be as it pleases Providence. Each costly material "will doubtless be employed in its proper place." There is a great convenience in this easy mode of leaving the morrow to take thought for the things of itself. Into the cost per foot cube, or per hundredweight, of timber framework and polling, of *temporary* brick arching, or of bolted and calked iron-lining (all of which has to be removed before the tunnel itself can be constructed), fixed in place, at 250 ft. depth below the centre of the English Channel, it is, on this view of the case, unnecessary to inquire.

A different, but scarcely a more practical, style of argument is applied to meet the difficulty of the great length of headway which it is proposed to run from one end. The actual length of tunnel proposed by "Engineer" and his friends is not stated. The account on which our remarks were principally founded spoke of a total length of sub-aquatic tunnel of thirty miles. "Little over twenty," is the estimate of "Engineer." Accepting this emendation (as really one of no great practical importance to the matter in its present state), we are told that because a full-sized tunnel, twelve miles long, run from each end, under the Alps, *will* meet accurately somewhere,—that is, because the engineers of the Mont Cenis tunnel *feel perfectly* "*sure* that the two ends will meet,"—therefore the meeting of driftways running for "over twenty miles" under the Channel is "reduced almost to a matter of certainty." We are grateful for the concession "almost." To those who know by long practice the hourly difficulties attendant on the charge of both the centre line and the levels of a troublesome tunnel, the encouragement drawn from the expectation that the hopes of the French and Italian engineers, who are working under circumstances of an entirely different character in Mont Cenis, will be fulfilled, fails to be absolutely reassuring.

Again, as to the water. There is, we are told, "every reason to believe that the tunnel will be a comparatively dry one." Of three universal reasons two only are hinted at; one is, that because coal workings, under the stone strata of the coal measures, are, in a particular instance, "comparatively dry," *therefore* chalk workings will be so. The other is, that because, *above* the level of the sea, no "considerable amount of water has been found in the lower chalk," therefore, *under* the hydrostatic pressure of the entire depth of the Channel, the same happy state of things will be found to exist. It must be observed, moreover, that, in the absence of definite borings, the very nature of the material through which the experimental driftway is to be run, whether upper chalk, lower chalk, chalk with flints, or half a dozen other materials, is, to say the least, only matter of geological inference, or, in other words, of scientific guess-work.

Not more conclusive is the comfort to be derived from the experience of the Kilsby Tunnel, "if an immense quantity of water were met with." In fact that experience points rather in the opposite direction. It was by the exhaustion of the sandbed filled with water which was encountered in that mile of work,—subterranean indeed, but far above the level of the sea,—that progress in the works was rendered feasible. In that case, and in similar instances, had the engineer run an adit through the deep cutting at each end of the tunnel to the face of the work, the cost would have been enormously lightened, at the price of a delay in the actual commencement of the tunnel. The tunnel and the cuttings once complete, the water could not again accumulate. Under the Channel the reverse would be the case. The reservoir of superincumbent water is absolutely inexhaustible. If entrance were once obtained, in any considerable volume, no pumping machinery in the world would make any permanent impression upon the flood. Every drop of water that percolated into driftway or into tunnel, would clear the way for a larger drop to follow. Every bucketful of water that was pumped out would increase the infiltration from above. And above is the ocean!

If then "semi-professional journals," among which we have not the false modesty to rank the *Builder*, "have suggested to the public that there are insurmountable difficulties of the most obvious character, which have been overlooked, with reference to this scheme," we can only join them in the regret that the skill of "some of the most eminent engineers" who "have carefully studied the subject for years," has not been illumined by a little more practical wisdom. The more closely the certain difficulties that oppose the prosecution of such a scheme—to say not a word of contingencies—are studied, the more obvious and formidable do they become. The more widespread, and the more accurate, our experience of actual tunnel work (and it will be clear to all practical men that it is in virtue of such experience that we speak), the more hazy, visionary, and indefensible does the project of a subterranean communication with the Continent appear, on mature consideration. That there exist neither commercial, financial, nor political reasons to justify such an attempt, is our deliberate opinion. Of the physical possibility of the undertaking we have not spoken, nor have we at all exhausted the question of its certain cost, and uncertain dangers. But no one can, in the present state of our geological and engineering science, actually demonstrate that the execution of the scheme lies within the power of man, or that, even if the amount of money estimated were raised, a sub-aquatic gallery to France could be attempted with more success than a tunnel through the volcanic bowels of Etna, or a railway to the moon.

NEW STEPPING-STONES.

Two little books, purporting to be stepping-stones to architectural design and building construction, have just appeared, which are likely to be useful, so far as they go, to the rising generation.* The one we shall speak of first is a catechism (of the Pinnock class), such as might be conveniently used in schools. It is called a "Stepping-stone to Architecture." It is certain that if some general idea of architecture were to be given in schools our young people would be provided with an inexhaustible source of pleasure. All our ancient remains would be looked at in a different light to that in which they are but too often now regarded. Instead of associating such sites only with the scene of picnics, or matches of one sort or another, our ancient buildings would call up emotions such as are now kindled only at the sight of classic shores. The different amount of interest felt for a building by a person who has some knowledge of architecture, and one to whom all details are a confused mystery, is so considerable as to be alone a sufficient reason for instructing youth with a fair understanding of the subject. A superb piece of architecture creates in the mind of those who can appreciate it exactly that exquisite kind of intellectual rapture that the cadences of a consummate poem impart, or that is wafted into the mind with the sound of matchless music.

A series of papers in our pages on the subject, addressed to ladies, some years ago, and afterwards gathered together as a little book,† were not without a certain amount of good effect, as we have reason to know.

Both student and building cannot be otherwise than benefited by an early knowledge of architecture, and we earnestly recommend its study in schools. The mere familiarity with the masterpieces chosen as illustrations would be a gain. And because early impressions are often nearly indelible, a conscientious endeavour should be made to render them exactly correct. Mr. Mitchell has evidently taken great pains to make his stepping-stones trustworthy, and but few blemishes can be found upon them; but still there are on his stones what we may, perhaps, call two or three patches of wet lichens that, to the unwary foot, might lead to disaster. In reply to his question, "Of what materials is it most probable that the earliest buildings were constructed?" he makes his wistful scholar reply, "It is most probable that the earliest materials used were rushes, reeds, and the branches of trees tied together, plastered with mud and thatched with leaves. The ancient Britons constructed most of their dwellings of *wickerwork*." Did they? From the very numerous remains on our wolds and hills of ancient British dwellings built of stone, we might conclude that was the material most frequently used in their construction. Again, the querist is anything but clear about the distinctive details of Saxon architecture. The so-called triangular arch is not mentioned, though the flat-headed and shoulder-headed so-called arches of later times are given; nor is anything said of the ballustre columns that are so distinctively pre-Norman. And, unfortunately, the illustration of an arch given as Saxon is Norman. Once more, the illustration of the Doric order should be described as not purely Greek, but Roman. Still, the general merit of Mr. Mitchell's book is considerable, and it is very cheap. There are twenty-four engravings in it reprinted from Gwilt's "Encyclopædia of Architecture," and forty-nine woodcuts.

The second stepping-stone is a link in a series of technical manuals. It is furnished with a hundred and thirty-three illustrations drawn on wood by the author,—consequently is a work of rather more pretension than the catechism just noticed. Moreover, it is adapted for the use of youth rather than children. Mr. Davidson states his aim is to give a general knowledge of the principles of building construction, and at the same time to afford elementary practice in architectural drawing. To this end he wisely advises students to read each section of his work carefully with frequent reference to the cuts, and attention to the lettering; and then to draw the illustrations to a larger scale and letter them, taking care to give, underneath the drawing, a description, or abstract, of the principles upon which the construction is based. This plan will enable them to remember what they study; and should they feel that what they have acquired is slipping out of their memories, they will have but to glance at their own drawing to revive their acquisitions. He asks, on the part of the artisan, whether the ability to understand and apply the principles of building construction will bring him wages, and answers —we quote his words—"Yes, it will; for we may fearlessly assert that never in the whole history of labour has there been a period when the workman has been deemed more worthy of his hire, or when greater efforts have been made, firstly to teach the artisan, and then to show appreciation of his work, than the present." So far so well.

After explaining the drawings required for building purposes, Mr. Davidson treats of the various departments in building construction, beginning with natural and artificial foundations, and going through the various kinds of masonry, brickwork, woodwork, roofs, floors, joinery, and fire-proof construction. And besides this varied information, he gives a special chapter concerning drawings for masons, another relating to drawings for bricklayers, and a third devoted to drawings for carpenters and joiners. This is an admirable arrangement, and one advised, by the best minds, as more suitable for our schools of art, than the vapid plan of teaching all kinds of scholars one sort of drawing, irrespective of the different trades in which they may be engaged, or about to be employed. As considerable licence is taken in the application of tints to trade drawings, the author gives a list of those chiefly in use among architects to express various building materials:—

Materials.	Colour.
Brickwork to be executed (in plans and sections)	Crimson lake.
Brickwork in elevations	Crimson lake mixed with burnt sienna or Venetian red.
The lighter woods, such as fir	Raw sienna.
Oak or teak	Vandyke brown.
Granite	Pale Indian ink.
Stone generally	Yellow ochre or pale sepia.
Concrete works	Sepia with darker markings.
Wrought iron	Indigo.
Cast iron	Payne's grey or neutral tint.
Steel	Pale indigo tinged with lake.
Brass	Gamboge or Roman ochre.
Lead	Pale Indian Ink tinged with indigo.
Clay or earth	Burnt umber.
Slate	Indigo and lake.

* "The Stepping-stone to Architecture." By T. Mitchell. London: Longmans, Green, & Co.
"The Elements of Building Construction and Architectural Drawing." By Ellis A. Davidson. London and New York: Cassell, Petter, & Galpin.

† "History in Ruins: a Handbook of Architecture for the Unlearned." By Geo. Godwin. Now out of print.

The drawings for masons are an example of planking, brick footings, and stone piers, as adopted in the circular vaulting at the London Docks; a bridge to cross a road; and a stone staircase; all worked out in every detail of their construction carefully. The drawings for carpenters show the various kinds of joints in timber, including the French scarf, "Trait de Jupiter," in which the key is placed at right angles to the slanting line of the scarf instead of parallel to the line of the beam; trusses, tenons; complete roofs; trimming; double and framed flooring; and a trussed partition for supporting floors, leaving a space for folding doors in the centre. Those for joiners show the construction of the woodwork for finishing the interiors of houses. In the matter of fire-proof construction, Mr. Davidson gives a notion of both the French and English methods in outline, reserving a more complete examination of them to a future manual. The French plan differs from our iron-girder system, our readers will remember, by using timber quarterings. The account given in the late Mr. Hosking's neglected book is quoted:—

"The framed structure being complete, strong oak batten laths, from 2 in. to 3 in. wide, are nailed up to the quarterings horizontally, at 4 in., 6 in., or even 8 in. apart, according to the character of the work, throughout the whole height of the enclosure and partition; and the spaces between the quarterings and behind the laths are built up with rough stone rubble, which the laths prevent falling out till the next process has been effected. This is to apply a strong mortar, which in Paris is mainly composed of plaster of Paris, which is there of excellent quality, laid on from both sides at the same time and pressed through from the opposite sides, so that the mortar meets and incorporates, imbedding the stone rubble by filling up the interstices and with so much body on the surface as to cover up and imbed also the timber and the laths, in such manner, indeed, as to render the concretion of stone and plaster, when thoroughly set, an independent body, and giving strength to, rather than receiving support from, the timber. The ceilings are constructed on a somewhat similar system."

We hope the day is not far distant when every workman in Great Britain will be able to make a working drawing, as well as understand that which is placed in his hands for execution. Both the little works we have here noticed may play a certain part in advancing matters towards this issue.

FALSENESS IN TRADE.

So that it seems to be, never mind what it is. Such is the maxim of thousands in this God-fearing country and wonderfully intellectual age. So that a house will just stand, a printed cotton just wash, or a soldier's coat hold togther till it is appropriated; so that the inferior stuff at the end of a piece of cloth cannot be discovered till it is opened, and the untempered worthlessness of the axes and picks will not be known till the bales are broken in the backwoods by eager workers dependent on sound tools, it is all right: trade has been done, profit has been made. Never mind the loss, the disappointment, the sorrow inflicted on others: profit has been made. The falseness and sham, the want of truth on the part of workmen in matters connected with their trade, are little less than appalling. You can be certain of nothing. You may buy pens that will not write, pencils with which you cannot mark, milk innocent of the cow, beer that is poisonous, locks that will not last a week, manure that has no pretence to a fertilizing quality, and seeds that could not grow in it even if it had. These last are amongst the worst kinds of deceptions,—deceptions that cannot be discovered till it is too late to supply a remedy, and the user's hopes for the year are blasted. Nearly the last Act of the past session of Parliament was one to prevent the adulteration of seeds, declaring that the practice of adulterating seeds, in fraud of her Majesty's subjects and to the great detriment of agriculture, required to be repressed by more effectual laws than those in force. To "kill seeds" means to destroy by artificial means the vitality or germinating power; and to "dye seeds" is to give to seeds by colouring the appearance of seeds of another kind. The penalty is 5*l.* for the first offence and 50*l.* afterwards, with publication of the offender's name at his expense in newspapers. We would have had the punishment heavier. For such scoundrels we have no consideration, no mercy; nor can we see any valid reason why the Act should not have come into operation at once, instead of being postponed, as we believe it is, till the beginning of next year. Surely it is not to enable these honest traders, disappointers of men's hopes, to get rid of adulterated stocks on hand?

The tendency of the world to listen to specious promises, to be beguiled by apparent cheapness, to

"Give to dust that is a little gilt,
More land than gilt o'er-dusted,"

encourages the vice to which we are pointing, but does not in the least excuse it.

We remember hearing of contractors, during one of the recent wars, who sent out to our soldiers boots so made and of such materials that they became saturated with the first shower, and endured no time. The commonest feelings of humanity, apart from thought of gratitude, prompt indignation, and should have prevented such an infamous proceeding. The indignation it excites within us has no bounds. We say with Emilia, and with our whole heart,—

"O Heaven! that such companions thou'dst unfold,
And put in every honest hand a whip
To lash the rascals naked through the world."

Even this baseness is paralleled, if it be not exceeded, by those who manufacture life-buoys of materials incapable of floating. Hard as it may be to believe, there is good evidence to prove that many of the life-buoys sold at seamen's slop-shops, instead of being stuffed with solid cork-wood, as they should be, are filled with rushes, straw, or cocoa-fibre, which being tied up in canvas will float for a little time, but are gradually saturated, and sink,—destroying what they should have saved. We have talked of whipping, but with the manufacturers of these painted lies, with these murderers for money, we would adopt a shorter course: we would unhesitatingly hang them.

VICTORIA-STREET AND THE ABBEY.

As compared with any other portion of the metropolis, the hallowed precincts of the ancient Abbey exhibit a melancholy account of ecclesiastical management. The whole district as far as Vincent-square is Church property, and in it we find more wretched dilapidated tenements,—we cannot call them houses,—than in Stepney or Rotherhithe. Within these precincts there are over thirty narrow courts, having an average of eight hovels with six rooms in each; every room tenanted by at least four human beings, and paying weekly rents. By day, if any one venture on an inspection, the whole is revolting to the sight; by night, after nine o'clock, it is horrible.

So far as Victoria-street has been completed, the improvements have kept pace with modern taste and requirements, and now that the Pimlico end of this fine thoroughfare has been opened out to Grosvenor-place a more direct route to the Houses of Parliament and the Abbey has been secured for the inhabitants of the West-end.

From Hyde Park Corner to the Victoria Hotel buildings of superior description have been ranged along the line, generally in an efflorescent French style, and the contrast becomes flagrant when a comparison is made with the adjacent church slums, which occupy a no less valuable position, in close propinquity with the glorious Abbey and the Houses of Parliament. Is it that Churchmen are wholly wrapped up in what concerns futurity, and therefore take less interest in merely mundane affairs?

The squalid condition of all the surroundings of the Abbey induced us before to suggest for the improvement of that important though neglected district that a continuation of Victoria-street should be made in a direct line from Strutton Ground, opposite Christ Church, to Victoria Tower.

At this point the street diverges in a slight angle, in a radius that would, if continued, strike in upon the Westminster Bridge: the continuation recommended, forming an elongated delta, would cut Abingdon-street in the centre, and issue in the broad space 50 ft. southward of the tower, being about 500 yards long, and, opening out from the planted grounds of Christ Church, it would strike in upon Great College-street, passing clear of the good buildings in Dean's Yard, and would require only a few feet (say half the roadway) to be cut off the Dean's garden: thus securing for the Dean and Chapter fine sites for the erection of suitable canons' houses, in lieu of those old red deformities which at present defile the venerable old cloisters, and which wholly blind and screen off the Abbey.

The work of restoration now in progress will be wholly lost as to external view, unless the old shapeless masses of brick hovels are cleared away from the south side. Some space with the standing trees should be left open, both for street effect and for the aspect of the Abbey, and then this thoroughfare would not only be one of the noblest of the far West, but it would open out resources of building profit.

At the present moment there are but two unappropriated building plots on this line, which has lain so many years in hideous fallow: one is at the end of Strutton ground, and it is yet open for the practication of this thoroughfare,—we cannot call it a boulevard, being only 60 ft. wide; the continuation might, however, be enlarged 10 ft. more, and with effect.

The new street would keep clear of Old Pye-street, alliniating nearly with it; and in cutting across at right angles Duck-lane, New Pye-street, St. Anne's-street, Great Smith-street, and Bowling-street, would in a range of about 1,000 ft. strike in upon Great College-street, clear of the College School, necessitating the clearance of some of the filthiest lairs in Westminster.

The fine ranges of chambers extending to Dean's-yard would branch off at an angle of forty degrees, and the intervening space now occupied by dens called Union-court, Cottage-gardens, New-square, and two or three other nameless courts, together with a dozen decrepit houses in the traverse streets, would make room for fabrics of a more respectable, profitable, and durable character.

By the practication of this new street, the Houses of Parliament would be approached in the distance of a quarter of a mile less than by the present issue into Great George-street; for there is a considerable deviation northward from Dean's-yard to be added to the return south from that point to Abingdon-street.

The most telling improvements of the metropolis are its bridges, quays, and grand causeways, and the present year will add much to the value and beauty of our city by the opening of Holborn, of Blackfriars, and of the Embankment. By the formation of a fine thoroughfare as here recommended, our old Abbey and the Houses of Parliament would be better developed, whilst a central, valuable, and vicinal district might be redeemed from waste for the convenience and intercourse of the whole population.

When it is considered that the fashionable quarter surrounding Eaton-square, and called Belgravia, is a mile farther westward from the centre; that its range is no higher above high water than these purlieus of the Abbey; and that all the noble mansions built there command the highest rate of rent and purchase, there can be no doubt but that clearances about the Abbey, extending in width even from St. James's Park to Vincent-square, would produce a good return financially, whilst the adaptation of the space to modern constructions would effect the redemption of a district now a disgrace to the metropolis.

REPORT ON SOUTH OF LONDON WATER SUPPLY.

THE Report of Mr. J. N. Radcliffe to the Medical Officer of the Privy Council on the results of an inquiry into the causes of the turbidity of the water supplied by the Southwark and Vauxhall, and the Lambeth, Water Companies, has been issued in a printed form.

In the outset the Reporter says:—

"Professor Frankland, in his Reports to the Registrar-General on the waters supplied by the Metropolitan Water Companies in the years 1867 and 1868, makes the following statements:—Of 1867 he writes,—

'Only on one occasion during the whole year have I obtained a transparent sample of water from the Southwark company's mains.' Of 1868: 'On several occasions the water of the Lambeth, Southwark, and Chelsea companies was in such a muddy condition as to render it totally unfit for domestic use. In February last the Lambeth company's water was so turbid, that brightly illuminated objects could not be seen through a stratum of it 12 in. deep. On account of the great amount of sewage which commingles with the river waters supplied to London, their efficient filtration before delivery is of the utmost importance. . . . . The Southwark company's water is almost invariably sent out in an imperfectly filtered condition. Only on one occasion in the entire year did I obtain a sample of clear water from this company's mains, and the same was the case in 1867.'

Referring to an instance of exceptional contamination of the Southwark company's water during the months of August, September, and October, 1868, Professor Frankland remarks:—

'I directed the attention of the company's engineers to the abnormal conditions of the water, pointing out that the admission of a certain proportion of tidal water of the

Thames at Battersea, where the company's reservoirs are situated close to the river, would cause the excess of impurities which I had observed.'"

The following table shows the number of occasions, out of a total of twenty-four monthly observations, on which, according to the reports of Professor Frankland to the Registrar-General, the different Metropolitan Water Companies delivered turbid water from their mains during 1867 and 1868:—

Name of Company and Source of Supply.	Number of Occasions when Clear and Transparent.			Number of Occasions when Slightly Turbid.			Number of Occasions when Turbid.			Number of Occasions when Very Turbid.		
	1867.	1868.	Total.	1867.	1868.	Total.	1867.	1868.	Total.	1867.	1868.	Total.
Thames:—												
Chelsea	9	7	16	3	2	5	0	1	1	0	2	2
West Middlesex	11	12	23	1	0	1	0	0	0	0	0	0
Southwark	1	1	2	5	5	10	5	4	9	1	2	3
Grand Junction	8	9	17	1	2	3	3	1	4	0	0	0
Lambeth	9	6	15	3	1	4	0	2	2	0	3	3
Other sources:—												
New River	12	10	22	0	2	2	0	0	0	0	0	0
East London	10	3	13	2	8	10	0	1	1	0	0	0
Kent	0	8	8	2	3	5	2	1	3	0	0	0

The Report then goes on to give evidence of the turbidity of the water of the Southwark and Lambeth companies at various times in course of the present year; and also as to the causes of that turbidity, and what had been done to obviate it. The great and rapid increase of demands upon the Southwark company's supplies,—an increase said to have overpassed, for the time being, all measures to meet it satisfactorily,—is referred to.

The Report states that

"The Southwark company has for some time been taking measures to overtake the increasing requirements of its district, and to remedy the insufficient provision for subsidence and filtration described. They have constructed extensive additional works at Hampton, which it is believed will be in full operation before the close of the present month (July); and they are making an important addition to the works at Battersea. The new works at Hampton are adjacent to the old works, and are supplied with water for the same intake. They consist of (*a*), a subsidence reservoir, having an area of 3½ acres, and capable of containing from 10,000,000 to 16,000,000 gallons, according to the height of the river; and of (*b*), three filter-beds, having a joint area of 3 acres, and estimated to be capable of filtering, when in full action, 420,000 gallons per hour. In connexion with these works two engines are being built, and are now well-nigh completed, having a total horse-power of 450. The new work in progress at Battersea consists of a subsidence reservoir having an area of 5½ acres, and a capacity of 24,000,000 gallons.

It is proposed, when the new works at Hampton are brought into operation, to devote them entirely to the supply of that portion of the Southwark company's district which lies westward of Vauxhall Bridge; the operation of the works at Battersea being limited to the district east of that point. It is estimated that from 35 to 40 per cent. of the entire supply of the company will be distributed from Hampton.

When the additions now in progress are completed and brought into operation, the Southwark company will have placed its works fairly on a level with its present requirements; but if the demand upon its supply continues to increase at the rate of the past two years, the margin of provision, even for the near future, appears to me to be too scanty. I must add, however, that the company has recently bought land at Battersea with a view to a further extension of their works when needed."

The general summary of the Report, with suggestions, is as follows:—

"In bringing this Report to a conclusion, I would state:—

I. *As to the Turbidity of the Southwark and Vauxhall Company's Water.*

(*a.*) *In respect of Causation.*—(1) That it is dependent upon the deficiency of provision for subsidence; (2) the insufficiency of the area of filtering surface; (3) and, in certain instances, upon one or other or both of the following causes: (*a*) the admission of tidal water from the Thames into the reservoirs at Battersea, either by direct inflow, by soakage, or by leakage; or (*b*) upon the admission of unfiltered water from the subsidence reservoirs into the pump-wells.

(*b.*) *In respect of Remedy.*—(1) That the company has already taken measures which will remedy for the present the defective provision for subsidence and the insufficiency of the filtering area; (2) but it should be required absolutely of the company that the communication of the reservoirs at Battersea with the tidal portion of the Thames, by means of the old conduit leading to Battersea Reach, and the direct communication of the subsidence reservoirs with the pump-wells, should be entirely cut off. Any contingencies that might arise, which would apparently, at the moment, justify the company, as a matter of expedience, and notwithstanding the illegality of the acts, in taking water into their reservoirs through the conduit communicating with the tidal water of the Thames, or in permitting unfiltered water to pass directly from the subsidence reservoirs into the engine-wells for distribution, can be provided for in other and more legitimate modes.

II. *As to the Turbidity of the Lambeth Company's Water.*

(*a.*) *In respect of Causation.*—(1) That the source of supply is objectionable; and (2) that the provision for subsidence, and (3) filtration, is insufficient.

(*b.*) *As to Remedy.*—(1) That the intake of the company should be removed above Moulsey Lock; and (2) that additional provision should be made for subsidence and filtration.

The removal of the intake above Moulsey Lock would not interfere with the present works at Long Ditton, and would at once do away with the cause of difficulty in the way of effectual filtration, which arises from the exceptional turbidity of the river at the present intake of the Lambeth Company's supply. The same remarks and suggestions as to intake are applicable to the Chelsea Company. The latter Company, it must be noted, is constructing two additional filter-beds at Seething Wells, having a joint area of two acres.

III. I have stated in an earlier portion of this report that no measures are adopted by the Southwark and Lambeth Companies, nor by the other Water Companies obtaining their supplies from the Thames, to ascertain whether the provision of the law as to the thorough filtration of the water delivered by them is properly carried out. The law (Metropolis Water Act, 1852, sect. 4) requires that the water supplied shall be effectually filtered; but it does not direct that any steps shall be taken to ascertain whether effectual filtration is accomplished. It is obvious that if the action of the filter-beds upon the water transmitted through them be not subjected to regular observation from day to day, filtration becomes little more than a hap-hazard process.

It is greatly to be desired that the different Thames Water Companies should keep a register, open when required to the inspection of any properly authorised public officer.

* * * * *

It is desirable, also, that the other Metropolitan Water Companies should keep a like register, modified in accordance with the nature of their source or sources of supply.

It is further desirable that the state of filtration of the water delivered by the different Metropolitan Water Companies, as indicated by transparency or turbidity, should be subjected to more frequent investigation by some public authority than at present.

IV. The remarkable differences existing in the provision for filtration by the different Thames water companies, and, indeed, among the Metropolitan water companies generally; the absence of any common consent among the engineers of the companies as to what are the conditions of efficiency, as indicated by these differences; and the too frequent insufficiency of the filtration of the water of all the companies (except that of the West Middlesex), suggest the necessity of an official investigation of the subject, with a view to determine some common rule of guidance.

V. Professor Frankland's references to living organisms in the sediment deposited by the water supplied by the Southwark and Lambeth companies suggested a comparative microscopical examination of the companies' water at different points from the source in its passage through the works. I collected samples for this purpose and forwarded them to Dr. J. Burdon Sanderson, F.R.S. I append Dr. Sanderson's extremely suggestive report.

P.S.—After this Report was written, the Report of the Royal Commission on Water Supply appeared. The suggestion of the Commissioners that all the Metropolitan water companies should be superseded by municipal authority appears to provide in another way for the kind of supervision contemplated in Section III. of my recommendations. J. N. R."

Dr. Sanderson's Report states that in each of the waters derived directly from the Thames he found an abundant deposit, which presented all the characters of the deposits described by Dr. Hassall in his paper on the "Microscopical Characters of the London Waters," published in 1851. It consists partly of formless granular matter, shells of diatomacea and other organic *débris* held together by a gelatinous-looking transparent substance, partly of living plants and animals, and partly of shreds of vegetable tissue and fragments of grit.

It appears to him to be of greater importance that time should be devoted to the investigation of the extremely minute and elementary structures which he describes as "rod-like bodies and microspores," than to the enumeration and description of the higher forms, *e. g.*, ciliated infusoria, diatomacea, and desmideæ, &c., with respect to which he holds that their only significance lies in their affording evidence of defective filtration. As regards monads, and more particularly as regards the actively moving microspores and rods, he remarks, they probably afford proof that chemical decomposition is in progress, and that the water containing them is in such a state as to be improper for consumption.

The Dresden Theatre.—The Court Theatre, Dresden, has gone the way of all theatres,—it was destroyed by fire on the 21st inst.

POSITION AND PAY OF ENGINEERS IN INDIA.

A PROPER understanding of the position of the Public Works and other Departments in India, and the right management of them, being of great consequence to a large number of our readers, we have on numerous occasions allowed representatives of the various branches to state their own views and grievances, and have advocated such reforms as seemed necessary. Continuing in this course, we give insertion to the following as representing the views of a considerable body of public servants.

Though in India the two things, position and pay, go very much together, yet one can be treated separately from the other, and position can be considered apart from pay. The subject as affecting civil engineers in that country is very important, and to understand the bearings of the question it is necessary to go back some years, and depict the state of Indian official society when there were no civil engineers. There were to be met with then five grand divisions of covenanted civil servants, officers, medical men, and chaplains of the army; a very small body of whites brought up on the hills, chiefly sons of officers, and known as "country born," half castes, and natives. The Covenanted Civil Service was, as every one knows, the best. It was enirely filled by nominated youths from England, trained at Haileybury, had a monopoly of civil appointments, and extraordinarily good salaries. Originally these covenanted civilians were the East India Company's mercantile assistants, and under the name of writers, junior and senior, merchants drew poor stipends, and boarded in the forts and factories, as if they were the clerks of a business house. In fact, no firms could in these days bring out subordinate agents on anything like the terms to fill the most minor situation. They were, however, allowed to trade on their own account, and on the Company getting territorial sway, they were sent into the districts to collect the revenues, and rule the subject people. Salaries remaining what they were, the Company's civilians exercised their authority as much as possible for their own advantage, levied protective duties on merchandise passing through their provinces, thus favoured their own ventures, and made enormous profits. Lord Clive saw that this easy state of affairs was ruinous to the interests of the Company, and an immoral method of Government, and that, though salaries were extremely low, the revenues were being absorbed at a fearful rate, and the servants of the Company were so but nominally, and taking things with a high hand. He therefore enormously raised the table of salaries, and strictly prohibited clandestine adventure and private trading. To ensure this result, the salaries had of course to be fixed so as to allow of civil servants living as they had been accustomed to do, and till recently it was very difficult to spend more than two thousand rupees a month in domestic establishments. To the very last of the Company, civil appointments were called writerships, but the consequence of increasing the salaries was to impart a tone which has made the covenated service one of the most upright bodies in the world. The possession of a majority at the council-table and heritage in all the places of authority in the regulation provinces of three presidencies gave the civilians an exaggerated power, one that could be exerted for the advocacy of their own views, and the furtherance of the interests of their order. It was not to be supposed that such advantageous conditions would not make them entertain a very good opinion of themselves, and from the court of directors downwards there was a general acquiescence in their elevation, and a conviction that they were qualified for any appointment, provided it was well enough paid. Where there was a good thing going, or one that could be set a-going, there would a covenanted civilian be found at the head of it. And if a particular person was suited to a particular place or office, and belonged to the Civil Service, the salary had to be amplified to the dimensions of his expectations. In point of rank, the civilians hardly needed any special graduation, as their published drawings would sufficiently indicate how they stood; but there was in India grown up with the remodelled Civil Service a very numerous army, most of whose offices were very moderately, not to say poorly, paid, but which had colonels and generals with emoluments almost rivalling the common run of civilians, and military rank, decorations, and glitter to add lustre to these. It was necessary

to introduce some relative order, and the table of Indian precedence was framed. The civilians were divided off into classes according to length of service. On first coming out they ranked with subalterns, after four years' service as captains, after eight years' residency as majors, and after twelve years as lieutenant-colonels, and so it went on. In framing the table, they had taken good care of themselves, as it took an ensign from fifteen to twenty years to become captain, and he often retired from the army on a pension without getting over the rank of major. Moreover, salary was not taken into account, and a civilian with a good round income need have cared very little about what class he was in. The writers on appointment in England had to undergo a smart pass examination, chiefly in classics, and then spent two years at Haileybury College, where there were the facilities for studying law, Indian languages, and political economy. Once in the college, it would require great indolence not to be able to get out of it. The military services were entered in two ways. For the cavalry and infantry services cadetships, as they were called, were given direct,—that is, the cadet immediately on passing a test examination to show he had received what is termed a military education, went out to his regiment in India. Certain cadetships were called Addiscombe appointments, and no one could go out to India under this form of nomination without spending two sessions at the Company's military seminary. There those who qualified received engineer and artillery commissions, and those who did not, or for whom there were no vacancies in these branches of the service, went out in the infantry, counting the time spent under instruction as *bonâ fide* Indian service for pension. Taking the case of two brothers, one nominated to Addiscombe and one to Haileybury, and looking at their position after, let us say, twelve years, the one would be a subaltern of artillery, on 256 rupees a month, and the other, with the relative rank of Lieutenant-Colonel, an acting collector on 2,000 rupees a month. There was nothing to account for this difference of position except the original nomination. The cadet might have changed places with the civilian, according to the caprices or accident of patronage. Such overwhelming differences in prospects could not but produce a strong jealousy between the services, and a practical belief in the minds of the civilians who had the giving of appointments in India, that a post intended to be filled by a military man, or for which an officer of the army was eligible, should be much lower paid than if it was a civilian that was to occupy it. Thus a military paymastership was worth half what a civil paymastership was. The feeling had sometimes a ludicrous manifestation. The wife of a civilian at Calcutta, narrating, so the story goes, who formed the party at a certain entertainment, said So-and-so were present, and So-and-so, and a lot of trash from the fort, meaning officers and their wives from Fort William. Such vulgarity of sentiment, it need hardly be said, cannot well have been general among the civil servants; but their immense distance from their contemporaries in salary cannot have failed to impart a certain claim to superiority in spite of themselves, and which at times would be apparent; but, in truth, the civil servant became in some ways superior to the mere regimental officer. From entry into the service his expenses had been of a much more varied kind, and his attention had been devoted to mental exercises, such as learning the Indian languages, observing the working of political economy, practising the law, adjusting taxation, or secretarial duties; while the subaltern was from day to day drilling his men, attending station committees, and dining at mess in the evening, for the most part physical occupations. The military life suited those who were not fond of study, contented with moderate allowances, and aimed at the reward of a soldier. There were also other things to be mentioned further on, which somewhat melted down the silver barrier between the Services. No power could be expected to pay its army upon the liberal scale of the Indian Civil Services; still less when there were thousands of Indian officers to hundreds of civilians. Besides, Parliament had fixed limits to the covenanted Civil Services. The Court of Directors availed themselves of no similar bounds existing to the extension of the army; and though their regiments were not over-officered, and promotion was excessively slow, still the number of native regiments was almost always on the increase till they mutinied in Bengal. After that event, those curious to see what reductions have been made can consult a local Army List belonging to each period, and may observe in India itself what further curtailment is desirable. Having a large native army gave the opportunity of giving away cadetships by wholesale. Coincident with the augmentation of the army was the extension of the Company's territorial sway; and for the many civil duties of Government in these increased domains there was no organisation except an inexpansive covenanted Civil Service educated as magistrates and private gentlemen. Accordingly, where civil engineers and architects were wanted, the corps of military engineers were distributed, supplemented by chance selections from the cavalry and infantry of those who expressed a wish to act in these capacities, or who were considered to have a taste for drawing. If a chaplain was wanted, an army chaplain was supplied. All doctors were military surgeons; and in districts where the benefits of English rule had to be conferred officers were taken as commissioners and assistant commissioners on passing an examination in a native language, and performed generally very fairly the duties of collector and magistrate, or sessions judge. It became the practice for a considerable number of officers to be permanently absent from their regiments in time of peace, liable to recall to take the field with them. There was thus an unlimited opening for a virtual increase of the Civil Service; and it had this advantage, for the Directors were prudent legislators, that they could obtain almost equally efficient service on lower terms. It has always been the custom to remunerate military staff appointments, such as those of adjutant-general and quarter-master-general, with their deputies and assistants, aides-de-camp, and the like, by salaries in addition to the pay of military rank. So that a major and adjutant-general would get a little less than a colonel and adjutant-general, and lieutenant and aide-de-camp less than a captain and aide-de-camp. This was the principle of the army. It kept a value to military rank; was the custom of every civilised country in dealing with the staff of armies; and was for the East-India Company a very cheap method. They could say to a young officer, "It is very true your staff salary and pay combined are small compared with the emoluments of your contemporaries in the covenanted Civil Service, but wait till you are a colonel, and you will receive all the benefit of your elevation." The principle was applied to all the services in connexion with the army, the commissariat, stud, &c.; and as public works were then administered by the Military Board, which also directed the foregoing civil branches of the army, all engineer officers received staff salaries on much the same scale as the commissariat, and, in addition, the military pay of rank. But the Civil Service owned no such law. Certain consolidated salaries were fixed for each class of appointment, and those in them got the full rate of remuneration, irrespective of their age or standing. Latterly the same privilege was extended to military officers holding office in the non-regulation provinces, but the Public Works Department remained on the old footing. The covenanted Civil Service had a fixed pension of 600*l.* a year granted to each member on completing a limited service; and, in order that the inducement to retire might be sufficient, Government deducted regularly 4 per cent. of each civilian's salary, and gave an annuity to make up the pension to 1,000*l.* a year. No civil servant could remain more than thirty-five years in India. The army had also pensions much according to length of service, and varying from, for twenty-two years, 191*l.* up to 450*l.* for thirty-two years; and for those able to stay on for an average period of forty years there were off-reckonings, bringing up the pension to 1,000*l.* a year. Any officer obtaining the position of full colonel could reside permanently in Europe without retiring from the service. The East-India Company were provident, and knew the circumstances of Eastern service. The Civil Service had a Widow and Orphans' Fund, to which they paid in subscriptions as a condition of appointment, and from it the widow of each civilian got 300*l.* a year. The army in each presidency had also a military fund, to which all cadets had to bind themselves to belong on their arrival in the country, and which they could not resign without severing their connexion with Government. Subscriptions to the fund were—for a single ensign in India, 13*s.* a month; on leave in England, 5*s.* a month. For a married ensign, 1*l.* a month in India, and 8*s.* 8*d.* in England. A colonel paid, unmarried, 4*l.* 13*s.* a month, or, married, 7*l.* a month in India; and 1*l.* 7*s.* 6*d.* and 2*l.* 1*s.* 3*d.* in England respectively. The ensign paid a donation to the fund on entrance of 33*l.*, and additional donations on attaining higher rank, the colonel's being 60*l.* On marriage an ensign paid 66*l.*, and a colonel 440*l.* The return for these payments was that bachelors who fell sick got their passage paid when it was not paid by Government, and, if subalterns, an income allowance in England; but the fund was mainly instituted for family purposes. It paid a widow's passage home with her children, gave her a pension of from 81*l.* a year for an ensign's widow up to 235*l.* a year for a colonel's. Besides this, children received from 20*l.* to 40*l.* each, and girls the latter sum till marriage or death. An officer wishing to bring out his family could obtain a loan of the needful sum. So that such an institution as the military fund was invaluable.

The medical services had also funds of their own, which, in addition to widows' pensions, gave annuities to prevent retired members having to go into practice again. The noteworthy feature about all these funds was that they were Government institutions, which the East India Company warmly supported. Every person in their employment was required to belong to them. The subscriptions and donations were levied by the State paymasters, and the money was deposited at high interest in the public treasury. The country-born population was a trifling fraction in the white community of India. Many of them received cadetships for which they were examined in India, and joined their regiments on exactly the same terms as those who came out from England. During the construction of the Ganges Canal, several educated at the Roorkee College were taken on as engineers, but in a subordinate capacity and with no assured position, and their prospects were very unsatisfactory. The fact is that no greater injustice can be done to a boy of pure European blood than to attempt to bring him up either on the plains or hills of India. The constitution is rendered sapless. Instead of a rosy colour and full development, there is a pallor with only a slight hectic flush to show the purity of origin. The face looks pinched and old. The association with natives continuously is not conducive to moral health; and a life in a country like India, where society is totally different from that of Europe, and abnormally constituted, is not calculated to give any breadth of view or real knowledge of the world. Such a person's ideas must be contracted, and they must be quite out of sympathy with the ordinary run of British gentlemen. This great difference in breeding is one of the chief causes of the gulf so often noticed and deplored between natives and Europeans, and neither in their case nor that of individuals country born can education bridge it over. A person brought up in the country can be told at once by a peculiar vacancy of expression, and if that does not reveal it a few moments' conversation does. A young lady of this class once, on being told a sumptuous banquet had been given on some public occasion in England, remarked, "Of course, everything on the table was hermetically sealed," being unable to conceive any luxury procurable out of a tin case, such as they are invariably only to be found in India. But as the second generation of pure Europeans is, according to the report of the Colonisation and Settlement Commission, unknown in India, the country-born class is a very small one, and not self-increasing. It seems, however, to have furnished the first civil engineers engaged on terms not very flattering to the profession, and is interesting in that respect, and as illustrating the subject in hand.

The next subdivision of society in India is the "Half Castes," a rather numerous, and, as may be supposed, varied body. The term is that usually employed to designate a mixed race in all parts of the world, but it is strongly objected to by the class in question, as being an epithet of reproach, and oscillating by turns between the entitlings of "Eurasian" and "East Indian," have adopted the latter. They, however, consider it very hard that there should be any special nomenclature for them, and are much afflicted with false pride. The term "half-caste," or its equivalent, is seldom or never applied to any but those East Indians who have never been out of the country; such of them as may have received an English education take their place with any other European; and there are many in all branches of the service who have not found

their descent a barrier to their advancement or reception into society. Of such we are not speaking, nor are we of a few who, though strictly East Indians, have risen as merchants or otherwise, to wealth and local repute. But the great body of half-castes were, from the very fact of their being brought up in India, excluded from the advantages a pure European would possess through his knowledge of men and manners alone. They generally intermarried with persons of colour, and by degrees the tendency was for them to become darker and darker, till at last they could hardly be distinguished from natives. From their knowledge of the vernacular tongues from childhood, they could not but have an intimate acquaintance with native ways and modes of thought, and so close a connexion could not fail in resulting in their borrowing much that was non-European. For various reasons they would not engage in manual labour or any pursuit that required much physical exertion. The more successful and best educated turned to Government service, and were employed as clerks: the only thing they were fit for. Others became assistants in the Presidency town shops, or apothecaries, beadles, pew-openers, and held those little offices which are filled in England by poor deserving people. But the summit of their ambition was to be a clerk, and it was a vocation into which they all pressed. A few made very fair overseers in the Public Works Department, but had neither the ambition nor the energy to rise higher. In aspirations and bent of mind they could have nothing in common with British gentlemen; their manners were not those of polished European society; their training had been acquired solely in India, and theirs was a constitutional inertness, the effects of climate of which the Englishman would not be very tolerant. But in the sphere which they selected, East Indians, by their respectability and docile demeanour, gained approbation, and they professed Catholicism. The natives were more at home than any of the other classes, and had a natural and complete development. The climate told even on their frame and activity, and caste determined their walk in life, but no scheme of government could be worked in India without their assisting largely. The higher castes, as the Brahmins, will not stoop to severe manual labour, but consider any kind of official employment highly honourable, and will begin on very small salaries, and sometimes on no salary at all, working their way up in the grades of clerks to higher posts. Every other description of Government work was done by some caste of natives. Their habits are very simple, the man of wealth dressing and feeding little better than the lower classes. So that their personal expenses are very few, and they can afford to accept moderate pay, and would only hoard or waste in marriages and indiscriminate charity an excessive remuneration. Before the expansion of education in late years the stock of knowledge with which a candidate began his official career was mostly confined to the three Rs, and he worked away side by side with his relatives at revenue forms and judicial processes, till he attained a technical proficiency, and they left vacant places. The vernacular languages of India have no literature, and very few natives indeed have any acquaintance with the celebrated Sanscrit classics, and they rarely read English books except as a school task; so in the public offices there were no natives of really liberal education who could be introduced into society and associate on equal terms with European civilians and officers of the army. Among so numerous a body as the natives in the offices of Government there could not fail to be clever intellects; but these had quite a different forming from the European mode, and were exercised on the practical routine of life of their countrymen, and the details of revenue collection and law-court decrees. The great bulk of the native officials received not more than 15*l.* a month even as head clerks of offices, subordinate and the actual collectors of revenues from the land, or junior magistrates. But their intimate knowledge of the ways of the people,—a thing that the oldest European servant of Government finds it impossible to fathom,—enabled them to materially increase their incomes, and no appeal against assessment or suit at law could be properly presented to the covenanted collector or judge without a regular fee being given to all those members of the office from the doorkeeper upwards with whom the client had to deal. Over this practice the European officers could have no check, as the advice of natives was essential to the conduct of business, and the increase of salaries, in a country where moral notions were so loose, would not necessarily abolish the evil, though it might and has diminished it.

In the Public Works Department the qualifications for an ordinary clerkship, and such skill as could be picked up from watching masons and labourers, would not lead very high. Much of the duty was out-of-door exercise, involving travelling from day to day, and though the expenditure of the department was considerable, a tangible result had to be produced, and a rigorous account system would disclose or suggest the taking place of wholesale embezzlement. Besides, the offices of public works were for design and audit, and little frequented by the mass of the population; so that there was scarcely any opportunity of adding to the Government salary. In consequence the more talented natives betook themselves to other departments, and the Public Works Department had to make the most of their inferior castes, and such Brahmins as could not get in elsewhere. There has always been this inferiority in the raw material of the Public Works Department to contend against, and it is a thing likely to continue, as the causes are ingrained in the disposition of the people. There were thus, several years ago, in India, the civil servants appointed and sent out from England. The military, medical, and clerical services, supplied directly or indirectly from the same source, all of them Europeans, and socially British gentlemen, wielding the supreme power, and occupying the positions of mark and most emolument. They contained within their bodies all heads of departments and the prime authority in military and civil matters. They constituted also the European society of India. One with another, they had a rank given them in this society by patent. They had either covenants or privileges which meant that they could not be dismissed during good behaviour without compensation, and the welfare and good name of their families was carefully guarded by means of insurance funds, for which Government was responsible. The ordinary functions could, of course, be carried on by a cheaper agency, and as a matter of obvious necessity the natives and those allied to them were employed in all petty and subordinate capacities in immense numbers. All classes were mixed up together, and employed in situations indifferently as their abilities pointed. The half-caste head clerk might have an office of natives under him, or a native might preside over a roomful of East Indians and natives, or a motley assemblage. The whole of this ancillary class were civilians engaged in strictly civil duties. They were persons gazetted to the posts they held, with a large share of the practical administration divided in minute distribution amongst them, and were virtually civil servants as much as a clerk in Somerset House or a tide-waiter. But they were in nationality, bringing up, acquirements, notions, demeanour, and social organisation totally distinct from the civil servants sent out from England, and incapable, in their own view or any one else's, of being confounded with them. They did not require sick leave or furlough to Europe, or to retire at an early period of life, or premiums for studying the native languages and the like. But being members of the Civil Service they could call themselves civil servants. It was found there was one distinguishing feature. The Haileybury civilians signed certain documents styled covenants at the East India House before coming out. Natives and others appointed in India signed no covenant. So at once a suitable appellation was discovered, and they were popularly said to belong to the uncovenanted Civil Service. Thus "uncovenanted" for years in India was taken to mean no European education, birth in the country, a humble social position, or a native one for which there is no European equivalent, and an incapacity for rising beyond an income on which a gentleman could hardly subsist. An uncovenanted service of this nature required no provident funds. Natives are polygamists, and hold much of their family property common, and the principle of caste ensures them against dire calamity. Half-castes, though more in need of some sort of insurance than natives, can, from the nature of the climate and their social system, which takes a good deal after the natives, suffer little domestic misery. Government accordingly promulgated an entirely different set of leave and pension rules for uncovenanted servants to those in force for their European officers. Read side by side they appear to go to the extremes of harshness and liberality. The sick leave of the covenanted civilian was to count as service; that of the uncovenanted was to be deducted. Where one had three years' furlough the other could only have one, and so on. But when the circumstances of the two parties were had regard to, the rules were fair enough as applied to each respectively. One of the first disturbances of the Indian fabric took place by the introduction of individuals who were neither in the army nor covenanted civilians into scientific appointments. Prominent instances were gentlemen entertained as civil engineers. It would have been thought that as they had satisfied the Home authorities as to their qualifications, and had the same requirements, they would as to leave, furlough, and pensions, have been treated like other civil servants sent out from England. But no; special clauses were inserted in their covenants to render their condition as nearly allied to that of uncovenanted civil servants as it could be made. Of course, the nominees unacquainted with Indian society would not immediately perceive the indignity to which they were subjecting their profession by signing such a covenant, which moreover was so incomplete as to leave sundry matters unsettled. On going out to India, and there presenting themselves, the Government ordered that in all respects not provided for in their covenants, civil engineers should not be, as might be supposed, under the generous rules of the covenanted service, but under those of the uncovenanted, specially framed to suit persons who were not gentlemen in the English sense of the term, and had never been out of India. This attitude and action of the Government shows an animus all through, and a desire to place civil engineers on a lower footing than they were entitled to, and which could not be done without abstracting from the local dignity of the engineering profession. Further, the names of civil engineers' grades were entirely left out of the table of precedence, and they take no rank with other covenanted officers. Such civil engineers as happened to enter the Government service in India from the railways or colleges were naturally put under the full operation of the uncovenanted service rules, and had no covenant at all, and thence it comes that there are three varieties of engineers in that country—the Military, the Covenanted, and the Uncovenanted, — according to its leave and pension rules. If there were any satisfactory pretexts for treating civil engineers, professors of the State colleges, headmasters of the educational department, others in the geological survey, and in posts which the advancing civilization of India calls into existence, as half-castes and underbred native clerks, there would be less inducement for complaint. The Government says, "Fair for one, fair for all. We now acknowledge neither race, nor caste, nor creed, in our services, and we wish to make it as homogeneous as possible, and many offices Europeans now are brought to fill we hope in course of time natives will be fit for; and we wish to have no more exclusive services and special rules founded on physiological differences between Englishmen and Asiatics. So long as we have our own old institutions of the Covenanted Civil Service and the Army, we intend to maintain their privileges. But your professions stand upon a much lower platform, and are not so influential, and we do not see it advisable to give them to you." The ratiocinating of jealous Anglo-Indian civilians who direct the Indian Government can scarcely hold ground in Great Britain, which owes so much to engineers, and some effectual redress may be looked for when it becomes understood what uncovenanted really means.

A. E. I. O.

Glue which will unite Polished Steel.—The following is a Turkish receipt for a cement used to fasten diamonds and other precious stones to metallic surfaces, and which is said to be capable of strongly uniting surfaces of polished steel, even when exposed to moisture. It is as follows:—Dissolve five or six bits of gum mastic, each the size of a large pea, in as much spirit of wine as will suffice to render it liquid. In another vessel dissolve in brandy as much isinglass, previously softened in water, as will make a two-ounce phial of strong glue, adding two small bits of gum ammoniac, which must be rubbed until dissolved. Then mix the whole with heat. Keep in a phial closely stopped. When it is to be used set the phial in boiling water.—*The Stationer.*

GUTTER CHILDREN AND DRUNKEN PARENTS.

The benevolent scheme of Miss Rye and others for the exportation of neglected female children to America forms the subject of a humorous and sarcastic brochure from the pen and pencil of good George Cruikshank, the champion of the total abstinence movement. He depicts Miss Rye as the driver of a dirt-cart, into which her assistants in the emigration movement are sweeping and shovelling the poor little "female" vermin, by wholesale, off the street, before the Angel public-house. "My own opinion of this matter," says Mr. Cruikshank, may be seen in the sketch at the head of this paper, for the proposition appears to me like sweeping up the little girls, as so much mud out of our gutters, and pitching them into a mud-cart, to be "shipped aboard of a ship," like so much guano, or like so many cattle, for a foreign market. And if such a *transportation* of innocent children, of that tender age, either girls or boys, should take place, it will not only be a *degradation* and a *disgrace* to this nation, but also a disgrace to the Christian world; for I consider such a proceeding would be contrary to the laws of nature, and also Christian civilisation. . . . Has 'Glorious Old England' come at last to such a state as this?!!! . . . The cause of nearly if not all this misery, crime, lunacy, neglect, and desertion of our 'Gutter Children,' and disorganisation, is, because the Christians and the Jews use intoxicating liquors as a beverage. It has been stated over and over again, by many of the leading men of the day, that 'Drunkenness is the *curse* of the country;' but this is a very *great mistake*. Drunkenness is a terrible thing, no doubt, but it is the *drink*, the intoxicating liquor, that is the *curse* of this country, and of many others. Most persons take these intoxicating liquors with a relish, and in many cases for many years, without any *apparent* harm or injury; but they, nevertheless, produce disease, and *shorten life*, except in a few solitary cases, and are the cause of all sorts of evils, from small offences up to the most diabolical deeds." He proposes, as an aid to its suppression, the formation of a "society for the prevention of cruelty to human beings and of the murder of children."

It is in all probability the cursed drink, he remarks, that has shortened the lives of the parents of these gutter children; and in cases of neglect or *desertion*, the drink has been the cause of the father and mother losing all paternal feeling, and unnaturally leaving their offspring, without caring what becomes of them. "And I must impress upon my readers the fact," he adds, "that there is not one *neglected* or *deserted* child amongst the millions of teetotallers, even of the most humble classes; and should there unfortunately be any orphans, they are also taken care of, and properly trained. . . . . Let us try to support these neglected children in their native land. And let every woman ask each other if she is a member of the Society for the Prevention of Cruelty to Human Beings, and for the Prevention of the Murder of Children."

We may here add on to Mr. Cruikshank's brochure brief notice of a pamphlet titled "An Inquiry into the Causes of the Present Long-continued Depression in the Cotton Trade, with Suggestions for its Improvement." By a Cotton Manufacturer. (Manchester: Heywood.) This, like the preceding, has the excellent object of reducing the dreadful evil of intemperance in view, but it is also a little Quixotic. The author urges indirectly that *if* the three hundred and odd millions sterling expended within the last three years in drink had been expended in the purchase of cotton and other manufactured goods, the building of houses, and so on, how much better it would have been both for trade and for the morals of the people; and no doubt it would. It is strange, he thinks, that men of intelligence cannot see this. We should rather think they can and do, although they may differ as to the best or most practical, and speediest and most effectual way of remedying the admittedly enormous evil. Dreadful as the effects of drink are, we are persuaded that a vast proportion of the "nine-tenths of all crime brought before the magistrates" attributed to drink are more particularly ascribable to the abominable and infuriating adulterations of the drink, to give intoxicating effects without the alcoholic intoxicant. "Toxicology" means the science of poisons, and brewers and distillers, as well as other drink-sellers, are highly skilled in this science. Are not *they* responsible for much of the crime which drink produces? The writer of this has a painful recollection of the loathsome prevalence of drunkenness in certain Scottish towns previously to the last quarter of a century, and for nearly a quarter of a century in all, but it never was accompanied by anything like the fearful crime with which it is now continually associated; and this difference he is convinced is attributable mainly to the increased skill and rascality displayed in the adulteration of all sorts of alcoholic liquors.

The total suppression of liquor traffic is simply out of the question; but we should not regret to see it so heavily taxed that the drinking of it in relatively large quantities in any shape by the masses of the people would be rendered totally—though not quite tee-totally—impracticable, from sheer want of means.

A puzzling problem has just been put before the Home Secretary by Mr. Darrah, a resident of Manchester. Mr. Darrah, it seems, is acquainted with a drunkard who suffers from frequent attacks of *delirium tremens*, during the existence of which he is obliged to be placed in a lunatic asylum. His wife is willing to pay for his retention in safe custody, but the officials declare that they have no power to detain this confirmed drunkard after recovering from the rabid symptoms of the disease. Mr. Darrah asks the Home Secretary, "What can be done to protect the wife and save the man from his own folly?" Mr. Bruce replies as follows:—

"The Government has announced its intention of introducing a measure for the better regulation of the trade in intoxicating liquors, which it may be hoped will have some effect in diminishing drunkenness and its attendant evils. The method, however, of dealing with persons in the condition of the man described in your letter is one of great difficulty, and Mr. Bruce is not at present prepared to recommend any change in the law with respect to such cases."

The Americans have taken the subject of the disposal of drunkards in hand, and are erecting homes for drunkards, or "Inebriate Homes" as they call them. A site comprising fifteen acres of land, in a pleasant locality, having a fine view of Staten Island and New Jersey, has just been set apart for the erection of what, on such a scale, is a novel institution—an Inebriate Home for King's County, New York. A charter has been obtained for the home, and about 30,000*l.* have been appropriated for the purchase of land and the erection of the buildings. An Act of the Legislature of New York has also been passed, granting it about 1,500*l.* a year from the excise licence fees and from fines levied in King's County for violation of the excise laws.

EXETER HALL.

Sir,—In the notice published in your last week's issue upon this work, it is said that it has been executed "with more force than finesse;" also that the forms into which the ceiling of the Great Hall is divided, are somewhat large and coarse; together with other remarks upon the treatment generally, to which we hope you will give us an opportunity of replying.

That a considerable amount of force is necessary in the arrangement of coloured decoration, in a building whose chief uses require the aid of artificial light, we think you will allow; and whether the force employed in this case is more than sufficient, we submit, cannot be positively decided until the building has been lighted up. We have had great experience in such work, and our fears have only been those of an opposite result, through being obliged to consider the hall is occasionally used by daylight. The forms into which the ceiling is divided are large, it is true, but the size of the ceiling itself, with the huge ventilators, placed at irregular intervals (which irregularity causes the break in the line you remark), and the necessity that existed of making these an important part of the design, quite prevented any more intricate arrangement, even should such have been thought desirable; and the coarseness of which you complain, is a matter of colouring only, which, as we have said, has not yet been tested. The walls of the building have been kept somewhat neutral in tone (but, at the same time, a colour that reflects light well), for the sake of emphasising the pilasters in order to carry the bright colouring of the ceiling down to that of the dado. That the pattern on the large organ should "suggest Egypt" is unfortunate, as with the exception of the lotus-like arrangement, which was adopted for the sake of effect, upon the large central pipes, there is nothing Egyptian in its character.

Mr. Maberly having placed the entire work in our hands, we trust that on his account, as well as on our own, you will think proper to insert this explanation.

Harland & Fisher.

THE ROCK OF CASHEL.

There are perhaps but few of those in any degree acquainted with the history of Ireland who have not at some time heard of, if perchance they may not have actually seen, the remarkable structure which is known as the "Rock of Cashel." The district in which it is situated formed at one time the metropolis of the kingdom of Munster, when Ireland—somewhat like England during the Saxon heptarchy—was divided into several kingdoms. The original territorial divisions of the sister country are still in a great measure recognisable in the provinces of Ulster, Munster, Leinster, and Connaught, all of which provinces are in some way distinctly remarkable. It is in what was in ancient times the chief city of Munster that the Rock of Cashel is located. It may be remembered that a recent visit was made to this spot by his Royal Highness Prince Arthur, with the especial object of inspecting the architectural ruins which have rendered the place so celebrated. Upon a rock which is called after a name which the Prince himself bears, and by which he will be alone known in Ireland, Saint Patrick's Rock, the remains of chief interest are to be discovered. From the warmth of the reception which was accorded to the youthful Prince in Cashel, it formed, as was well known, one of the most pleasing incidents of his journey through the country; and his Royal Highness, judging from the remarks which he made upon the occasion, was apparently far from displeased at the way in which his metamorphosis into an Irishman was actually accomplished. The building, or series of buildings, more accurately speaking, which were inspected on the occasion of the Prince's visit, are commonly designated by a title which altogether fails in conveying an adequate or intelligible construction. It is not simply the Rock of Cashel that is intended to be described. Were it possible that the memory could embrace a period anterior to the erection of the venerable pile of buildings thus entitled, the Rock of Cashel itself, upon which they are founded, would still possess some claims to attention. This rock is an irregular elevation of the surface of the land in a locality where a dwarf mountain of this kind would perhaps be least expected, and from its isolation alone it would probably attract notice as a curious freak of nature. It is in reality a bold upheaving by subterraneous pressure of the stratified limestone of the district, as described by Archdeacon Cotton, sloping down gently at some parts towards the surrounding level, while at other points it is precipitous, straggling, and steep, and clearly exposes to view the strata of which the hill is constituted. It presents the appearance of a prodigious natural mound, which may have been discovered to have been composed of material adapted to building purposes—which it undoubtedly is—and of which no inconsiderable portion came to be quarried and removed from the locality. So far is the rock disassociated from the general features of the neighbourhood, that its existence is attributed altogether to a legendary source.

There is in the northern part of the county Tipperary a range of mountains out of which, at one particular spot, a large gap may plainly be distinguished from the summit of the rock. This huge indent is geographically known as the "Devil's Bite," or "Bit." Tradition runs to the effect that Saint Patrick, the titular saint of Cashel, so nearly annihilated Satan's influence throughout these parts, that in sheer discomfiture his enemy began to prey upon the mountains. Being observed in attempting so orthodox a piece of devilry as this, Saint Patrick gave chase to Satan, who, in order to facilitate his escape by flight, let fall that considerable morsel which constitutes the Royal Rock.

It might perhaps, says Archdeacon Cotton, be thought rather unfortunate for the credit of this story that the mountain from which this bite was filched is not composed of similar material: a circumstance which, in the Archdeacon's view, seems calculated to invalidate the hypothesis. Upon this rock, on the more level portions at its highest elevation, are the remains of various buildings in a more or less perfect state of preservation. They afford evidence of having been erected at different periods, but in order of erection appear to have been united and blended together in one common structure, until in the mass they have acquired features of considerable attraction and interest, and indeed of magnitude. As in the case of many other ancient historical structures, much difference of opinion prevails amongst those who claim to speak with authority upon such subjects with regard to the comparative antiquity of the assemblage of buildings upon the rock. Much diversity of opinion exists also as to the actual character of the architecture exhibited by them. We should premise that the pile of buildings is composed of a round tower, differing but little from numerous similar structures which abound in Ireland, of a chapel known as Cormac's Chapel, and of a large cathedral building, with which the other structures are incorporated.

In the immediate neighbourhood, besides the extraordinary spectacle which is presented by the ruins upon the rock, and observable from that point of view, may be plainly seen the more neglected but still venerable remains of several independent ecclesiastical buildings which surround, and were no doubt in some way related to those upon the rock. It is commonly believed by those resident in the neighbourhood that a subterraneous communication existed between some of these outlying buildings and the cathedral pile by which they are overlooked.

Of the nearest of these adjacent structures which have been suffered to fall into an altogether irreparable state, we may mention Hore Abbey. It is now covered with wild ivy. A rank and luxuriant vegetation of grass and weeds has overgrown the mouldering ruins accumulated in the interior of this building by successive parturitions of the walls and other parts of the edifice. The insidious force of the vegetable growth, the stress of weather, and the force of violent winds, have all contributed to lay the building low, and no efforts appear to have been made to avert or repair their mischief. The tendency, curiously enough, has been towards an interior aggregation of the dislocated parts, and it is attended with some degree of difficulty to discover a sure footing within the mural inclosure remaining. Irregular masses of masonry have fallen from time to time, and have become firmly intergrown and wedged amongst tombs and relics of an ancient past which seemed entitled to particular care and preservation. It is on account, perhaps, of the superior interest which naturally attaches to the more commanding range of buildings on the rock that the surrounding and outlying buildings have been allowed to arrive at their present condition. It is a condition, at all events, in the case of Hore Abbey, of such complete and pitiful dilapidation that any remedial endeavours towards its restoration would now prove most likely unavailing and hopeless.

The rock itself—by which is always intended the buildings thereon—it is understood was allowed also to fall into a somewhat analogous state to that presented by some parts of the abbey, from which it was rescued only within the past forty or fifty years. Upon the occasion of a serious accident which befel the structure in the early part of the year 1848, on the very day, as it happened, of the last revolution in France, which rendered the occurrence a subject of superstitious comment, the general state of the building attracted more than ordinary notice.

On the 22nd of February of that year a violent storm so shook the building, that one of the towers parted in two from top to bottom, and the southern portion fell to the ground with a terrific crash, some portions still remaining exactly on the spot where they then fell. One large mass, 10 ft. or 12 ft. in length, and 4 ft. or 5 ft. high, which includes part of the parapet of the tower, and therefore must have fallen from the greatest height, appears to have glided down without turning over or altering its position, and now stands upright and entire in the churchyard, immediately under the spot which it formerly occupied. By this accident the interior of the lower vault, and of the hall above it, is exposed to view from the south. Dr. Cotton, in describing this occurrence, sought to awaken a more particular interest with regard to the future preservation of the building, and adverted to the state in which the rock had formerly existed. The *débris* of the roof had accumulated to a great height within the church, burying beneath them tombstones, fragments of windows, capitals, corbels, &c., and, being covered with long waving grass, presented a sad picture of desolation. This rubbish was removed, the whole place was cleared, the level of the original floor was reached, the base of the four fine pillars supporting on arches the central tower, were exposed to view, and the just proportions of the edifice shown.

In September, 1841, the interior of the round tower on the Rock of Cashel was deepened by the South Munster Society of Antiquaries, when searching for bones, with a view to establish their theory that the round towers were places of sepulture. Their proceedings have been thus alluded to by Mr. John Davis White, in his "History of Cashel of the Kings."

The round tower is in a high state of preservation, and is united to another class of structure, which, on the score of antiquity, is less open to misapprehension, perhaps, than the round towers themselves. This is called Cormac's Chapel.

By some writers the erection of this building is attributed to Cormac, a descendant of Olliol-olum, king of Munster, Cormac himself being proclaimed King of Cashel A.D. 902, and exercising at the same time archiepiscopal functions. He perished about six years afterwards in battle, on the plains of Moynilbhe, not far from Leighlin, and, in accordance with these annals, Cormac's Chapel must have been erected in the beginning of the tenth century. It is asserted, on the other hand, that the foundation of the building was laid as late as the year 1134 by another Cormac, the grandson of Carthack, king of Cashel. Dr. Ledwich "sees nothing Danish in the architecture of this church, and supposes it to have been erected in the tenth or beginning of the eleventh century, by some of the first-named Cormac's successors; but he adds that it was prior to the introduction of the Norman and Gothic styles, for in every respect it is purely Saxon." Dr. Petrie refers to it as "the beautiful and well-known stone-roofed church on the Rock of Cashel, called Cormac's Chapel, one of the most curious and perfect churches in the Norman style in the British Empire."

One of the main difficulties with regard to its date would appear to reside in the circumstance that, compared with the superior building with which it came to be subsequently blended, it possesses features of far higher antiquity. It is known from authentic records that the larger structure was erected about the year 1169, by Donald O'Brien, king of Limerick.

Cormac's Chapel, regarded apart, would form far from an imposing structure. It is a regular church, divided into nave and choir, the latter narrowing in breadth, and separated from the former by a wide arch. The length of the nave is 30 ft.; breadth, 18 ft. Length of the choir, 13 ft. 8 in.; breadth, 11 ft. 6 in. Breadth of the grand arch leading from one to the other, or into the choir, 9 ft.

Elaborate descriptions entering into the minutiæ of the structure have been pursued by Dr. Petrie and others. "The chancel is ornamented on its side walls with an arcade like those of the nave, but of a richer character, the arches being supported by columns, and the apsis or quadrangular recess for the altar at the eastern end is similarly ornamented; its arcade, however, being open, and its columns enriched with fluted spiral and chevron mouldings. The ceiling of the chancel is groined with ribs springing from the angles, and is ornamented with four human heads at their point of intersection. Grotesque human heads are also placed immediately beneath the vault on the east and west walls, and the whole of the vaulted roof, as well as the sides of the chancel, appear to have been richly painted in fresco, in which the prevailing colours used were red, yellow, brown, and white. In the small side recesses curtains were represented, and arches were depicted on the ceiling." These paintings, Dr. Petrie believes, were contemporaneous with the building.

High above this structure, which is now absorbed in the corporate structures of the main building, towers the grand cathedral. This is a large and capricious structure. Upon a closer examination, those bolder features which more readily attract observation at a distance, from an apparent departure from unity of conception of plan, are seen, however, to blend into the requirements and general conformity of the design. It is a finished embodiment of an ecclesiastical military stronghold. From its elevated and central position it commands a range of view of many miles in extent in nearly all directions. As approached from some directions, it presents a naturally inaccessible frontage, while an extraordinary ingenuity has been displayed in endeavouring to command the path by which alone an approach to it could be attempted.

The latest period at which there is any record of hostilities having taken place upon this spot was in the year 1647, as alluded to in Mr. John Davis White's interesting archæological researches, when it was besieged by Lord Inchiquin and the Parliamentary forces. After a severe bombardment, the place was taken by storm. The buildings suffered much damage from the cannonade; and after the capture of the castle, the victors blew off the roof of the cathedral with their cannon.

The access to what originally constituted the residential parts of the structure was contrived with skill. There is a pentagon tower attached to the building, which is ascended from the southern transept of the cathedral by 127 stone steps, which wind to the right. From this staircase there is a passage to the kitchen over the entrance door, and another higher up to the belfry. There is also another doorway at the same height as the latter, which led to a passage along the roof of the nave to the principal apartment, or dining-room, of the castle. There was also a private passage to and from this chamber in the thickness of the walls. There exists a continuous passage, indeed, throughout the main parts of the building within the thickness of the walls, through which one only abreast might advance over the general structure, ascending and descending over the arches, encountered throughout the journey, and conforming to the intricate exigencies of such a passage. A curious aspect of the times is necessarily called up in imagining that through this dark and narrow pathway in olden periods kings and nobles may have sought refuge or flight through the thickness of the walls of their own chambers, which were actually constructed with that contingency in view, gaining with difficulty the stony way along within the very hearing of their foes.

The cathedral is composed of the limestone of the vicinity, and is of Pointed architecture. Its chancel forms the longest part of the cross in plan, which is altogether an unusual occurrence in such structures. From the nave there is a descent to the vaults of the castle, by about half a dozen steps. Here it is said in 1647 twenty ecclesiastics retired for safety when the rock was taken by Lord Inchiquin, and being unable to break in the door, a fire was kindled outside, and the occupants of the vault were suffocated.

The round tower in union with and forming part of the buildings on the rock, constructed, like Cormac's Chapel, of brown gritstone, is connected with the northern transept of the cathedral, and is entered, or rather may simply be looked into, by an opening made here in the wall.

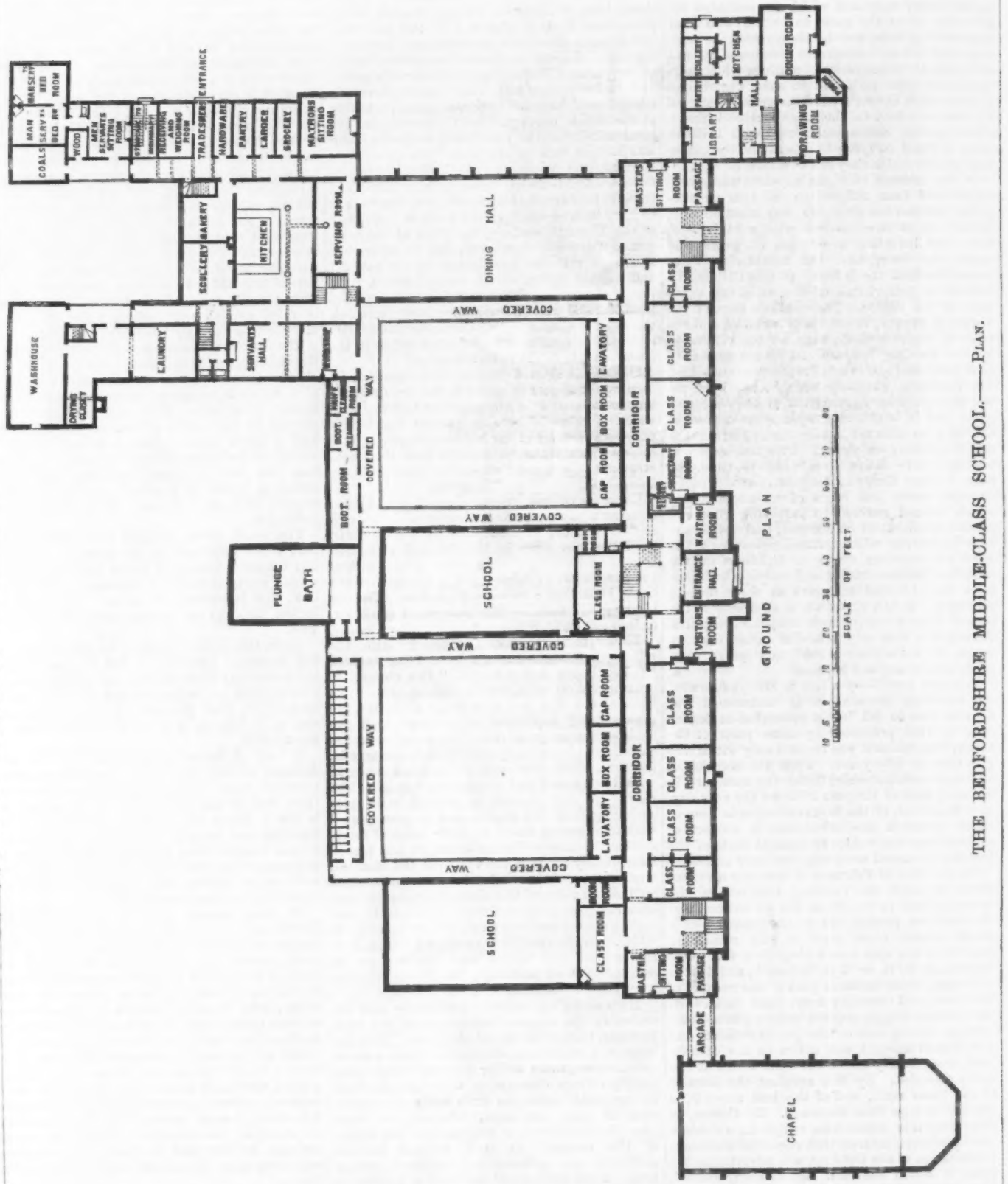
From the height afforded by some portion of the adjoining buildings, a full interior view of the tower may be obtained; and looking upward through this stupendous column of space merely enclosed by dark glistening walls to the top, an almost forbidding and overpowering view is represented.

A well of water exists upon the rock at a distance of only 30 ft. from the surface, whose presence there is certainly much more curious than that of the well-known fly in amber. It is found under the staircase of the northern transept, and is what is called a wishing-well. It is a custom when partaking of the water to express or form some wish, which the draught is believed to possess the magical property of expediting to a favourable turn.

We may remark that the wish which we formed upon the occasion of our pursuing this ceremonial, as led thereto by the worthy guide, is not yet realised. When it is so realised we shall no doubt refer it to the far-reaching virtues of this happy well. By what pressure or from what source the water arrives at this elevation appears inexplicable. A depth of 30 ft. is still very far from the level of the surrounding country, in which unquestionably numerous wells are to be found; but the presence of water at so elevated a point remaining at a certain fixed level must assuredly indicate a somewhat singular geological formation of some parts of the district worthy of scientific investigation. While its source remains undiscovered it confers an auxiliary argument as to the alleged origin of the entire fabric.

THE BEDFORDSHIRE MIDDLE-CLASS SCHOOL, BEDFORD.

WITH the support of the Duke of Bedford, Lord Cowper, and other influential persons, a new school, projected with a view to give the sons of the agricultural and commercial classes a sound suitable education at a moderate cost, has been erected in a healthy situation, in the parish of Kempston, and contiguous to Bedford, and was opened on the 16th of last month. The London and North-Western Railway station being only a mile distant, and the Midland Railway a mile and a half, the institution is favourably situated as far as railway accommodation is concerned. The premises occupy twenty-two acres, some sixteen of which will be set apart as playgrounds. The building extends to a width of about 300 ft., and is flanked in front by the chapel and the head master's residence. The former is connected with the main building by a covered way, and is calculated to accommodate 300 boys, the number for which the school is intended. Over the main entrance,—



which is approached from the high road along a sward leading by a flight of steps to a spacious terrace,—a tower rises to the height of 90 ft., with two clock-dials and a turret for flagstaff. The plan we give shows the appropriation of the ground-floor. Opening into the main corridor, which runs parallel with the frontage, there is a suite of rooms, for class use, as also for the accommodation of the directors, the secretary, visitors, &c., in the rear of which are two school-rooms and the dining-hall, respectively divided by quadrangles. The kitchens, storehouses, and other appurtenances occupy the remainder of the area. On the upper floors there are seven dormitories, furnished with iron bedsteads and hair mattresses, while a master's bedroom, with a window for inspection, is provided at the extremity of each hall. In close contiguity to each, also, there is a lavatory, together with a separate apartment for washing feet, fitted up with rows of trays and benches at a slight elevation from the floor. The housemaids' closets are fitted with cistern, hot and cold water taps, and cupboards. All parts of the building are supplied with water, hot as well as cold, from tanks fixed at the top of the tower over the front entrance; the hot water used for warming is conveyed to the apparatus from an engine-house on the basement, the supply being obtained from a deep well close by. The engine-house is fitted with a 6-horse power engine, by Messrs. Manlove & Co. (Nottingham), and a patent boiler by Messrs. Howard, Bedford Britannia Works. The piping throughout the building and the gas pendants have been supplied by Messrs. Richardson & Co., Holborn. The dining-hall is 72 ft. by 32 ft., and has six four-light gas pendants. The kitchen is conveniently situated with respect to this hall, being separated from it by a serving-closet, which is fitted up with plate-racks, lead cisterns, and other appurtenances. From the kitchen access is obtained along the east corridor to the various stores. It is fitted up with a cooking apparatus from the establishment of Messrs. C. Jeakes & Co., and a large oven, supplied by Messrs. Pain & Moulton, of Bedford.

Provision has been made for an infirmary, and the pupils will have access to a swimming-bath. Moule's earth-closet system has been adopted. To guard against the danger of fire a number of mains have been distributed over the building. The exterior is of red pressed bricks (Old English bond), with Bath stone dressings. The architect was Mr. F. Peck; and the contractor, Mr. Huddlestone, of Lincoln.

The terms for board and education are 30*l.* *per annum*, including every expense. Bedford is exceptionally well provided with the means of education, however ill or well they may be used.

THE BEDFORDSHIRE MIDDLE-CLASS SCHOOL, BEDFORD.—MR. F. PECK, ARCHITECT.

THE ANSTICE MEMORIAL INSTITUTE AND WORKMEN'S CLUB, MADELEY.

THIS building has been completed as a memorial of the late Mr. John Anstice, a public man much esteemed in the locality. The building has been erected by Messrs. Nevett & Sons, builders, Ironbridge, after a design by Mr. Johnson, of London, whose design was approved of out of upwards of fifty sent in for competition. The exterior is faced with pressed red brick, the cap, strings, cornices, and other architectural portions being executed in white local stone. In the centre of the façade, and forming one of its principal features, is the entrance-porch, which is built entirely of stone. The windows of the ground floor are coupled, the division being a stone pier, with moulded cap carrying the architrave and lintel. At the level of the first floor a deep string-course is placed, which is continued round the building. At each end of the facade a portion is slightly projected, forming in appearance wings. The seven first-floor windows are of large size, semicircular-headed, the arches being of stone springing from piers with moulded caps. The building is crowned with a cornice of bold proportions. The roof is covered with slates. The principal entrance is under the porch with vestibule, beyond which is the entrance-hall, 25 ft. long, with the stairs to lecture-hall at one end. The floors of the entrance-hall and porch are laid with encaustic tiles, the gift of Mr. G. Maw. Adjoining the entrance-hall are the men's and youths' club-rooms, smoking, reading, and librarian's rooms, lavatories, &c. A corridor leads to the hall-keeper's apartments, to the general kitchen, scullery, stores, larder, pantries, &c. On the first floor, at the landing of the principal stairs, are ladies' retiring and committee rooms. Adjoining is the large lecture-hall, 40 ft. wide, and 70 ft. long, with raised platform at one end and gallery at the other. The inside face of the walls is of white pressed bricks, relieved by a few red bricks in bands and arches. The ceiling is boarded and divided into rays, by moulded wood ribs with ornamental pendants. At the intersection, the ceiling is flat in the centre, with very large cones at the sides, this form being considered best for sound. The warming is by hot-water pipes fixed behind the projecting skirting with iron gratings on the top, the furnace being in the basement. The lighting is by star burners fixed to the pendants on the ceiling. Ventilation is provided for by a number of small openings communicating with the external ventilators. The whole of the internal woodwork is stained oak-colour and varnished.

OUR BUILDING STONES.

PERMIT me through your valuable journal to express still further my thoughts on building stones. In your number of January 23, I gave a general outline of various stones, noticing the causes of decay, &c., and hope that many of your readers have visited the buildings mentioned, where they can have ocular evidence, and thus be enabled to judge of the truthfulness of my remarks in your journal of the above date.

There have been a great number of letters published lately on this subject, and some of the writers have given us their experience of six months' labour, such time being too short for any gentlemen to be able to gather the information which is essential for any inexperienced man to know before he gives his opinion.

First, we will commence with Portland stone, it being most extensively used in London, and as there are so many various descriptions, we will merely mention three.

1. Some of your readers may not be aware that there is a class of brown Portland which possesses all the elements of decay, and will decay in whatever atmosphere it is placed. This brown Portland is of a sandy nature, each particle being placed loosely together. When the face of such stone is rubbed you are enabled to see each particle separated from the others, and some of this stone is of a hard nature; but all practical men, who have been in the trade more years than some have months, can detect this stone wherever it may be, and without applying a magnifying glass or subjecting it to a chemical analysis.

2. There is another kind of Portland stone, having a cream colour, or lighter than the one just mentioned. The grain of this stone is close, and appears cemented together by a liquid; it is softer than the brown stone before mentioned. This kind of stone when rubbed on the face looks almost like marble, it being so fine. It will resist the weather and stand in whatever atmosphere it may be placed.

3. The white Portland, or so-called "best bed." The first bed of this kind which I will mention runs thin, and the texture is of a slimy nature, much resembling soap. It is very fine in the grain, and those who are not acquainted with the quality of the stone admire it for its fineness, but there are very few elements in it but what will decay. Another bed which I will mention as belonging to this "best bed" runs 3 ft. or 4 ft. thick, and is of a harder nature than the thin bed just referred to. This is also a white stone, but possesses more of the qualities of the cream-coloured stone. This stone I have seen used very extensively, and it stands the weather well; at the same time it requires great care in its selection for outside work.

Bath Stone.—A number of opinions have been recently expressed upon this stone, but none of the writers have stated anything in relation to the various beds. Allow me to say just a word or two. The thin beds of Corsham Ground stone, Farleigh Down, and a number of other stones, are generally of an inferior quality, as you will often observe an inch or two on each side of the bed which is of a red, soft, sandy nature. These thin beds will not stand the effects of the weather so well as the high beds, for the higher the beds are the better the stone generally is. It is cheaper for the contractor to buy the high beds; it may, perhaps, cost more in price, but he is saved in a great measure from those soft outside portions referred to, and also from waste.

Darley Dale is of a brown colour, the grain firmly cemented together, and extremely hard; for instance, after it has been removed from the quarry for some six months, it is almost as hard to work as granite. The best quality of this stone sparkles like silver; it will stand the weather well, for several works have been constructed in London with this stone, and are now in excellent preservation.

There are a great number of Grit stones which I could mention that will stand our atmosphere, such as Hawley Park, Gazeby, and many others from the neighbourhood of Halifax, all of which can be used with safety.

A limestone which is obtained from the north of England is a very good building stone, and is worked in a similar manner to granite, with small picks and axes. One or two churches were erected from this stone in Preston some thirty years since, and are still in good preservation. It is quite essential that all building stones, of whatever description, should be fixed on their bed or joint bedded, as we have seen the ill effects produced by stones being fixed otherwise. I have not gone into the various ingredients of which these stones are composed, but merely mention those that will and those that will not decay. In conclusion, I hope the time is not far distant when we shall see granite introduced in London for bases, plinths, columns, &c. The light-coloured granite when left from the axe would match well with our Portland stone, and the expense of this granite is not so much in contrast with other stones as might be expected.

WILLIAM CROSS,
Manager of the Prince Consort Memorial, Hyde Park.

TELEGRAPHIC PROGRESS.

ALTHOUGH the telegraphs are not formally to become the property of the Government until the 1st of January next, an arrangement has been come to between the Postmaster-General and the companies, that the system should pass under the control of the Government staff next month, in order that the latter may have practical experience of the working before their own responsibility commences. The present scale of charges will, however, be maintained, and the receipts will be paid over to the companies every week.

On and after the 1st of January, the instruments of the various companies will be collected at the principal Money-order Office in Cannon-street, which will be the telegraphic head-quarters. The present office in the Exchange will be retained as a receiving-office, and the messages will be transmitted thence to Cannon-street by the pneumatic tube. Branches will be established at all, or nearly all, the money-order offices in town, and the messages from these branches will be sent by wires to Cannon-street, where they will be checked, and despatched to their destination. The present staffs will, for the most part, be retained in the service of the Government. Individuals who are not required will be pensioned, if they have been five years in receipt of quarterly salaries, or seven years on weekly wages, from the companies. With regard to the messages, the Government will start with a uniform rate of 1s. for messages of twenty words (exclusive of the addresses) to any place in the United Kingdom. A considerable increase of business is expected. Reduction of rates, extension of business, and increased efficiency will be kept in view as objects to be attained whenever practicable.

A man who owes a bill in London, says a New York paper, can now pay it in four hours by simply going to Wall-street and purchasing a document known as a "cable transfer," a device born of the great Atlantic telegraph enterprise, whereby the equivalent of the money which he gives in New York will be immediately delivered to his creditors in London.

The *Times* anticipates a grand development of speculative rascality during the next few years in telegraphy. "The public," he says, "will be invited from time to time to construct some specific line at a heavy cost, on glowing representations from the experts in these matters as to probable results, and so soon as the required subscriptions shall have been paid they will find some rival line projected by the very same parties, who will then in the 'rapid progress of electrical science' have discovered that the new one can be laid in a much more speedy and efficient manner at 20 or 30 per cent. less expense."

The messages by the French cable the week before last were 478, yielding 1,068*l.* In the previous week they were 448, yielding 1,040*l.*

THE PRUDHOE CONVALESCENT HOME.

THE Prudhoe Memorial Convalescent Home at Whitby, in Northumberland, has been inaugurated by the Dowager Duchess of Northumberland, in the presence of the Duke and of Earl Percy, Lord Algernon Percy, Sir William Armstrong, the Mayor of Newcastle, and a numerous assemblage besides. The institution has been erected as a monument to the memory of Algernon Percy, fourth Duke of Northumberland, K.G., and is situated on Whitley Links. It is conveniently placed for sea-bathing purposes, and commands an extensive prospect of the surrounding country, with a fine sea-view. The foundation-stone was laid with much ceremony, on the 14th of June, 1867, by the Hon. Henry George Lord Warkworth (now Earl Percy). It is intended as a place of resort for invalids from all parts of Northumberland and Durham. It will be an auxiliary to the Newcastle Infirmary, of which the Duke was a chief supporter.

The building is designed partly upon the pavilion plan. It consists of a central block containing the "administrative," or house department, with a central corridor, running at right angles with this, out of which the various rooms project, both back and front, with open spaces between for ventilation and for light and sunshine. The front of the building faces the sea, and the whole of the apartments have a sea-view. The length of the frontage is 230 ft., and the various offices extend to a depth of 190 ft. backwards. The structure is built entirely of stone, and the style of architecture adopted is Gothic, of a simple and plain character, adapted to the purposes of the building, except the central portion, in which some architectural embellishment is displayed, in recognition of the munificence of the late Duke of Northumberland. The line of frontage towards the road is enclosed by ornamental iron railing, in the centre portion of which is the entrance to the gateway, with gatekeeper's lodge, partially recessed in a segmental curve. The building, which is raised several feet above the level of the roadway, is approached by means of an elevated terrace with steps in the centre, and by inclined roadways on each side. On reaching the building, the vestibule, which is open, is approached by several steps. This entrance consists of a triple arch supported on polished red granite columns, with encaustic tile flooring and stone walls in parti-colour. On either side are the porter's and matron's sitting-rooms; behind is the surgeons' room, and adjoining are the grand hall and stone staircase. The grand corridor, 8 ft. wide, intersects at this point,

and on the one side are the day-rooms and dormitories for the men, and on the other the same for the women. Behind the hall are salt-water and fresh-water baths for both sexes, and beyond these is the dining-hall, approached on either side by the respective occupants. The kitchen and cooking department, with several out-offices, including wash-houses, laundry, pantries, &c., are in the extreme rear. Accommodation is provided for between fifty and sixty patients, but the building is designed to accommodate ultimately 100 inmates. The latrines are so arranged that they cannot affect the atmosphere of the house—being separated from the day-rooms and dormitories, and ventilated on the "through and through" principle. The dormitories are also arranged on this plan, each bed being placed against the wall, with a window on each side of it, and also with corresponding windows exactly opposite, for purposes of light and air. The whole structure is fireproof, the several staircases being of stone, and the corridors arched and covered with encaustic tiles. The floors are of pitch-pine, and are polished, and the walls are coated with Parian cement, which can be washed when required. The ventilation and warming are in harmony with the new principles adopted throughout the construction of the building, everything being as natural as possible under the circumstances. That portion of the building which the architect has selected to express more especially the memorial character of the structure is the centre block, and here he has thrown the whole of the ornament and the architectural expression. There is a central tower, about the middle of which is proposed to be erected on a projecting pedestal and under a carved canopy, a statue of the late duke.

Mr. Thomas Oliver is the architect under whose superintendence, with the assistance of Mr. John Adams as clerk of the works, the building has been carried out. Mr. Joseph Keyll was the contractor for the whole of the works, and Messrs. Walker & Emley undertook the engineering department. The total cost has been about 20,000*l*.

SOMERSET ARCHÆOLOGICAL SOCIETY.

ALTHOUGH we briefly noticed the trip of this society to Cheddar and Rodney Stoke on the first day of their meeting, the excursions did not really commence until Wednesday. The first halt was made at the village of Rowberrow, which lies in a secluded hollow of the Mendips, and is the centre of the mining district. Of the parish church Mr. Parker gave some account. Having heard that the old mansion of Langford Court was worth a visit, some of the party went there for the purpose of noticing the principal features of the house, over which they were shown by Mr. T. B. Collings. After leaving Langford Court the Ancient British Camp of Dolbury was visited. The ascent was a trying one, especially to the stouter members of the party. Passing through the grounds of Mendip Lodge the next place reached was Burrington Church, which was described by Mr. Freeman. They then proceeded to explore Burrington Combe. On reaching the cavern known as Aveline's Hole, as many of the company as could descended into it, and Mr. Boyd Dawkins gave a brief account of it. A short cut across the fields led to a Roman Amphitheatre, the plan of which was pointed out by the Rev. Prebendary Scarth. A few yards further on the President called attention to some hut circles as indicative of former occupation. The party then dropped down to Charterhouse, where they partook of luncheon in the schoolroom.

While the horses were resting and their drivers dining, a party set off across the fields on a visit to the works of the Mendip Mining Company, who find it more profitable to work up the slag on the surface, which was cast aside by the Romans as useless, than to dig up the ore from the bowels of the earth. It was stated that this slag contained about 25 per cent. of lead. A visit to Cox's stalactite cavern closed the day's proceedings, and the party returned to Axbridge about eight o'clock.

Winscombe was the first place visited by the archæologists on Thursday. Though not so numerous as on the previous day, the party filled several conveyances. Leaving Winscombe, and journeying for four or five miles under the shadow of the Mendips, the next stoppage was made at Loxton, a small village romantically situated under Crook's Peak. Here was seen a curious little church quite different in character from those larger, later, and finer churches which the archæologists had been visiting.

Christon, a small parish, situated in the gap between Crook's Peak and Bleadon Hill, only a few minutes' ride from Loxton, was the place next visited. The inspection of the church being completed, the journey was continued to Banwell Caves. The explorers then proceeded to Banwell, and on arriving at the village, they found the business nearly at an end. Sir Stafford Carey read a paper on "Year Books," and Mr. W. A. Sandford was to have read one on "The Rodentia of Somersetshire Caves;" but time pressing, it was taken as read, and the company agreed to visit Banwell Church. Mr. Freeman was again the guide. The concluding meeting was held in the schoolroom, Banwell, where luncheon had been provided by the liberality of gentlemen in the neighbourhood.

SOCIAL SCIENCE CONGRESS, BRISTOL.

THE Congress in Bristol promises to be satisfactory. The order of proceedings stands thus: On Wednesday, 29th September, there will be, at 3 p.m., special service at the Cathedral; sermon by the Right Rev. the Lord Bishop of Gloucester and Bristol; and, in the evening, the inaugural address by the President, Sir Stafford H. Northcote, bart., M.P., in the Victoria Rooms. On Thursday, at 10 a.m., address by Mr. G. W. Hastings, president of the department of Jurisprudence and Amendment of the Law, in the Victoria Rooms. At 11 a.m. the departments will meet in their respective rooms; and at 8 p.m. the Mayor will hold a reception at the Colston Hall. On Friday, at 10 a.m., address by the Rev. Canon Kingsley, president of the Education Department, in the Victoria Rooms. at 11 a.m., the departments will meet; and, at 8 p.m., working men's meeting in the Colston Hall, Sir Stafford H. Northcote in the chair. On Saturday, at 10 a.m., address by the Right Hon. Stephen Cave, M.P., president of the Economy and Trade Department; at 11 a.m., the departments will meet; excursions to Cheddar, and to the Bristol training-ship at mouth of the Avon. On Monday, 4th October, at 10 a.m., address by Dr. John A. Symonds, president of the Health Department; at 11 a.m., the departments will meet; and, at 8 p.m., *soirée* at the Victoria Rooms; address by Miss Carpenter, on Female Education in India. On Tuesday and Wednesday there will be meetings, and on Thursday an excursion to Chepstow Castle and Tintern Abbey. The ladies' conference will be commenced on Wednesday, September 29th.

THE TRADES MOVEMENT.

THE masons at Sheffield have, at a meeting presided over by the mayor, for the purpose of bringing about an amicable settlement of the dispute between masters and men in the building trade, deliberatively adopted a resolution in which they decline to submit the question to arbitration. They alleged as a reason that by so doing they should isolate themselves from the 290 lodges forming their National Association, by none of which has arbitration ever been adopted.

The operative stonemasons' strike at Manchester having lasted about twenty-two weeks, and there being no prospect of an immediate settlement, the masons made the following overture to the employers:—"That we, the operative masons of Manchester, Salford, and Hulme, do hereby agree to accept 30s. and 48½ hours per week." The reply of the masters was:—"That no men be engaged but on the terms that have been adopted during the last few months." The men, it is said, are determined to make no more concessions, and will not submit to the hour system and arbitration.

At the adjourned meeting of the London carpenters, in support of the Blackburn joiners, on strike for the nine hours, it was resolved—

"That this meeting hears with satisfaction that a conference has taken place between the employers and workmen of Blackburn, with the object of settling the existing dispute, and is of opinion the offer made by the men is one that should be accepted by the employers; and that we continue our pecuniary support to the Blackburn men until the strike is settled."

The Blackburn strike has now terminated on the masters' terms,—hour work in place of nine hours' day work.

In the course of the discussion of the London carpenters, the necessity of inaugurating a nine-hours movement in London was strongly advocated. It was stated that, while hundreds of joiners were walking idly about the streets, several firms were working their men twelve and thirteen hours per day. It was also stated that at Messrs. Trollope's firm the men for some time past had been working from six o'clock in the morning until eight at night, and that last week an order had been issued that they were to go on working until nine o'clock. Some of the men who remonstrated against these long hours had been discharged in consequence.

The twenty-first anniversary dinner of the Paddington Operative Bricklayers' Society has been held at the King Alfred, Lisson-grove; Mr. George Howell in the chair. The chief business of the evening was to receive from Mr. Howell, who had been delegated by the trade to attend the recent trade congress at Birmingham, a report upon the proceedings as affecting the labour question. Referring to the question of shortening the hours of labour, he stated that the prevailing opinion expressed at the congress was in favour of an eight-hour day's work. Although the congress had decided in favour of the limitation of apprenticeships, he did not agree with that decision. It was a principle which never could be enforced in their own (bricklayers) trade, and if enforced, it would have the effect of driving young lads into trades which were already overstocked. As to the protection of trades-union funds, the Government had passed a temporary measure which would effect that object, and it was not likely that Government would recede from the position they had taken up. The congress had unanimously condemned the combination laws. Co-operation and industrial partnerships had been approved of by the congress, and he looked upon the scheme as likely to be one which would solve the labour problem by giving men a direct interest in their own labour. Arbitration had been warmly approved of by the congress.

SEWAGE MATTERS.

Sewage Culture at Aldershott.—The Aldershott sewage farm contains 130 acres, 77 of which have been under irrigation, some of it for several years. When the sewage was first applied there was no vegetable soil, properly so called, on the common. The surface consisted of reddish and yellow Bagshot sand, with layers, more or less dense, of iron-sand, locally termed "pan," which required to be broken up before the ground could be prepared for crop. This ground contained 95 per cent. of silica, 3 per cent. of protoxide of iron, and a trace of vegetable matter. The surface, to a depth of 4 in. to 6 in. was in many places nearly as hard as concrete. Perhaps the very worst possible soil has in this experiment been brought under successful irrigation and culture. It is remarked, in the report of the Army Medical Department, that all the elements of the question have been dealt with, and the result has been that the offensive barrack and South camp latrines have been abolished, the station drained, all the refuse water rendered innocuous by irrigation, and the fertilizing matter removed out of it and applied to the production of food on ground which had previously yielded nothing in the form of useful vegetable produce. Mr. Blackburn, the lessee of the Aldershott Farm, has given some interesting information regarding the method of cultivation adopted. The whole sewage of the South Camp and barracks was not turned on to the farm until 1866, scarcely three years ago, and the following have been the results, as regards produce raised per annum on each acre:—Potatoes, 4 to 5 tons; swedes, 12 tons; mangolds, 18 tons; garden turnips, 300 bushels; cabbages, 16,000 plants. There is, besides, a large area under Italian rye-grass cultivation, which is cut five or six times a year for cows, and four times a year for horses. The lowest cutting averages six tons per acre, the highest fourteen tons per acre. The maximum produce is forty tons of rye grass per acre per annum. As the culture advances, the number of articles is increased. The usual cropping of the farm is as follows:—Potatoes, 26 acres; Italian rye grass for food, 29 acres; Italian rye grass for hay, 15½ acres; green crops, 6½ acres; total, 77 acres. This absorbs the whole summer sewage of the camp and barracks. The crops to be raised this year will be Italian rye grass, potatoes, mangolds, swedes, turnips, cabbages, tares, onions, carrots, and haricot beans. There has been no smell from the farm; the earth

deodorizes the sewage as soon as it touches it. There are no complaints of nuisance from the irrigated land, nor of injury to health. All the plants grown are healthy-looking and wholesome for consumption. At first there was some prejudice against the produce, but that has been entirely removed.

Sewage Utilisation and Reconstruction of Sewers at Liverpool.—The Liverpool Sewage Utilisation Company has commenced operations on a small farm at Ince Blundell, and the directors speak hopefully of the project. The undertaking, however, would appear to have been beset with difficulties. In the first place, the negociations with Major Blundell for land at Blundell-sands fell through, and it became necessary to carry the pipes three miles further than was originally contemplated. This, of course, was attended with increased expense; and to make matters worse, several of the warmest friends of the scheme were unable, owing to the commercial pressure, to give the monetary support which they had promised. Then the Earl of Derby and Lord Sefton insisted upon a deposit of 1,000*l.* in hard cash as a guarantee against any damage that may arise to their property from the undertaking; and the result is that the company finds itself in a deficiency of about 3,500*l.* The affair is practically at a standstill for want of funds, and an appeal to the shareholders and the public is to be made.—— The reconstruction of the sewers in Nesham Park, which, on examination, were found to be defective, has been completed. Some months ago the West Derby Local Board, in whose district Newsham Park is situated, and who ultimately will have charge of the whole of the sewers in the park, refused to incur the responsibility of taking them over until they had been examined, and their construction certified as perfect. This refusal resulted in the borough engineer being requested to make a careful inspection; and on this being done it was discovered that in many places the levels of the sewers had been miscalculated; and it was also found that at several points the brickwork had fallen in, and that the sewers had literally collapsed. A considerable portion of the main sewers running through the park was thus condemned and taken up. The sewers are now, on an average, 11 ft. in depth, being about 4 ft. deeper than those which were condemned as ineffective. As the contractor alleges that the original sewers were executed under the superintendence of the corporate surveying officials at the town-hall, it is, we believe, a matter of uncertainty on whom the cost will fall.

Leamington.—An agreement has been arranged between the Earl of Warwick and the Leamington Local Board for the latter to pump the town sewage upon his lordship's estate for thirty years, for 450*l.* a year. The rise is over 100 ft., and the distance about two miles. It is estimated that the necessary works will cost the Board 12,000*l.*, and that the annual expenses will be 700*l.* The earl will take all responsibility as to injunctions. The A B C process of Messrs. Siller & Wigner is in operation at Leamington for this year.

The New Sewage Works at Halifax.—In reply to remarks made by Mr. Bristowe, before the Master of the Rolls, that the contractors for these works were unable to find the necessary sureties, the *Halifax Guardian* has been requested by Messrs. Dovenor & Helm to state that they were not unable to find sureties, but that they declined to enter into the severe bond imposed upon them by the Vice-Chancellor's chief clerk.

The Drainage of Brighton.—Mr. Hawkshaw, the engineer called in by the town council to advise it on the point of carrying the sewage to a distance from the town, has made his report. Three "practicable modes" of doing the work are considered by Mr. Hawkshaw; namely, 1st, by an extension of the present system of deep-sea drainage, the cost of which would be about 66,500*l.*; 2nd, by an intercepting sewer to the westward, to which there are such "insuperable difficulties" that Mr. Hawkshaw cannot advise its adoption; and 3rd, by an intercepting sewer to the eastward, which Mr. Hawkshaw recommends as "the most perfect and efficient" plan. The cost of this latter plan Mr. Hawkshaw estimates at 80,000*l.* It would include both the Cliftonville and the Brunswick-square districts. Mr. Hawkshaw concurs with Mr. Hawksley and Dr. Letheby that sewage delivered into the ocean from 1,500 to 2,000 ft. from the shore is not likely to be productive of disease or objectionable to health; nor, he adds, "do I believe that any smell arising therefrom can be detected by persons on the shore." But, he says, its discharge is plainly visible from the road facing the sea; to those who go out in boats, and who chance to come near the point of discharge, the effluvium is unpleasantly evident; and "those who bathe from boats cannot escape occasionally finding themselves floating in a bath of what must necessarily be far from agreeable." The mouth of the sewer, however, Mr. Hawkshaw points out, might be taken more than double its present distance out to sea —to 4,000 ft.; and he shows how the discoloration of the sea by storm-water might be dealt with in this way. The expense would be 66,500*l.* According to Mr. Hawkshaw, the most perfect plan is to construct an intercepting sewer from Cliftonville to Portobello (four miles eastward of the Brighton boundary),—a distance of seven miles and 160 yards,—with a fall of 3 ft. per mile, and with, at intervals, ventilating shafts,—"which," adds Mr. Hawkshaw, "could be so arranged as to be unobjectionable."

THE STUDY OF ARCHITECTURE ABROAD.

M. PILLET, an architect in Paris, formerly of the *Ponts et Chaussées*, announces that he is about to open a preparatory *atelier* for such as desire to enter the "École des Beaux Arts," and where complete instruction will be given. The studies are to be organised so that the students may not only acquire the knowledge necessary for admission, but be enabled to go at once to the second class, and be so practised in drawing as to have no occasion to take further lessons in it. He points out in his announcement that in existing *ateliers* the candidates for admission to the school only obtain instruction in architecture, and are obliged to have recourse to other professors for mathematics, descriptive geometry, history, drawing, and water-colour painting, which expensive studies being pursued separately, and without general control, do not always produce such a result as could be desired. If it be remembered, however, continues M. Pillet, how important these branches of instruction are, not simply to enable the student to pass the examination for admission, but for definitive education in architecture, the advantage of pursuing them under one direction will be obvious.

Architectural students in this country, and those who have the management of them, may learn something from this announcement if they consider it properly; and it is with that object in view that we refer to it. They may see something of what is necessary if English students would keep abreast with the architects of the future abroad, and fit themselves to aid in advancing the artistic character of their country.

RETROSPECTIVE EXPOSITION AT BEAUVAIS.

BEAUVAIS, famous in old times as the see of one of the six spiritual peers of France, has inscribed its name on the records of the present year as the scene of what is called a Retrospective Exposition. The term, when once explained, is not to be condemned. The exhibition itself has been one of more than mere local interest; and the idea, hinted by the title, of illustrating the history of the past, down to our own time, rather than of endeavouring to whet the edge of the manufacturing rivalry of the day, is one worthy of very full development.

Two gentlemen of local distinction, the Baron de Seillere, of the Château de Mello, and M. Delaherche, of Beauvais, appear to have been the principal instigators of, and contributors to, this interesting exhibition. The objects displayed were divided, chronologically, into two categories, that of those anterior to the eighteenth century, and that of those of the eighteenth and nineteenth centuries. Two saloons, adjoining the great hall of the Industrial Exposition, were occupied by the articles contributed. Objects of stone and of bronze, Gallo-Roman and Merovingian relics, coins, medals, enamels, portraits, works in iron and in earthenware, old MSS., chests, and furniture, formed the contents of the ancient division.

Ancient arms, contributed by M. Barraud, are described as being those of a race of men who lived as far back as the Glacial era! Whatever doubt may be thrown on this determination of date, we come nearer to historic times in regarding the next relic, a magnificent Gaulish sword, of bronze, the alloy being of the same proportions that are found in early Grecian weapons. In a leaden sarcophagus, together with some jewels and ornaments of female attire, was found an ivory bas relief of Bacchus, surrounded by fauns. A similar plaque is said to have been found near Rheims. A Roman *pilum*, of a form altogether unusual, with a quadrangular point more than 2 ft. long, is another relic of early Roman date. Later, but still telling of the victories of Rome (if with the keys rather than with the sword), is the copper-gilt cover of a reliquary, and a diptych, of German work, dated in 1495. Mention must also be made of two portraits, in *Limoges* enamel, one of King Francis I., and one of his queen, Claude of France, bearing the signature L. Limousin. A sketch of a *chasse*, designed in 1459, for the cathedral of Noyon, by Gravat, a bourgeois of Amiens, and a fifteenth-century manuscript of the customs of Normandy, are also among the chief objects of interest in this portion of the collection; which further contains a fine piece of tapestry work, representing the vision of Constantine, which was commenced by the orders of the famous Fouquet, intendant of finances, and completed at the *Gobelines* manufactory, by the order of Louis XIV.

The division adopted, being according to date, and not according to the character of the object, is such as to render unnecessary a summary of the jewels, stuffs, *faïences*, and other articles exhibited in the second, or modern saloon.

"ORNAMENTAL PYROGRAPHIC WOODWORK."

BURNT patterns on woodwork are of old date, and some few years ago an establishment was opened for supplying them on a large scale, of which our readers were told at the time. Some fresh works have now been opened in Glasshouse-street. In the ordinary samples, the designs are burnt into veneers of sycamore or maple, and are supplied wholesale to builders, cabinet-makers, and others, ready for laying in the ordinary manner; but, if preferred, the designs can be applied to the solid work, to insure greater durability. By the use of wood so ornamented all necessity for painting is, of course, avoided. It is inexpensive and worth looking to.

HOUSE BUILDING AT CHISWICK.

SIR,—In an article in your issue of Sept. 11th, under the head of "House Building at Chiswick," mention is made of "One Gothic mansion in the district, with a river frontage, and two peaked round towers," stating that it suffers from "being cellared, and at high tides has some 3 ft. or 4 ft. of water standing in the bottom, which, of course, saturates the greater portion of the house, and keeps it in a damp condition for an indefinite time after each flood."

As there is but one house in the district to which the first part of this statement can allude, one that I erected about twelve years ago for J. Pullman, esq., I beg to give an unqualified denial to the second part, viz., that it suffers from being cellared, &c.

The house is built as substantially as possible, *none* on the estate being more, if indeed so, solidly constructed; and when I tell you that Messrs. Holland & Hannen were the contractors who carried out the cellarage in question under my personal superintendence, I think it will be a sufficient guarantee that the work was well done. Since reading the article from which I have quoted, I have seen the proprietor who has inhabited the house since its erection, and he will fully endorse my statement. Your insertion of this letter will greatly oblige

RAPHAEL BRANDON.

LOW RENTS.

SIR,—I have just seen the letter of Mr. W. S. Trueman in your esteemed publication of the 11th inst. He is a bold man. May his liberality and example be followed not only by owners of house property, but also by those who supply our daily bread and other necessaries, and you may be assured we shall hear less of strikes and discontent; and the publichouse and crowded lodging will be superseded by a respectable home for every man.

ONE OF THE BEES.

WELLS AND MINES.

SIR,—Having so frequently read of accidents and deaths occurring in wells and mines for want of some speedy means of rescue for the sufferers, it has occurred to me that some sort of "safety-cradle" or frame-work of either iron or basket-work might be so constructed as to be kept *constantly at hand* at the bottom of wells or of the shafts in mines, and so secured by an extra length of chain or rope as not to interfere with the ordinary work of the windlass, but ready to be brought up with its human freight when necessary by a little extra working of it. Thus, if in repairing a well a workman were overcome by the unhealthy inhalation of deleterious gas, he would fall into the very receptacle ready for his rescue, instead of into the jaws of death—as the fouler vapours at the bottom or deep water might prove; and if even not drawn up in time to prevent so serious a catastrophe, no other life need be risked to bring him up. When for use at the bottom of a shaft,—for instance, where ready accommodation might be required for many people,—the cradle might be made in tiers or stages, and formed so as to collapse (like the

head of a phaëton) when not required, and the chains or ropes might be of sufficient length to admit of its being allowed to stand aside when not required, so as not to interfere with the ordinary means of egress; and a bell being at hand to communicate the alarm to a watcher above-ground, a little extra work would soon bring a few more at least up to bank than could be rescued in the ordinary manner without unnecessary delay.

M. A. H.

AN IMPRACTICABLE CONTRACT.

An arbitration case, between Messrs. Cutler and the Redhill Gas Company, has just been decided by Mr. T. G. Barlow, gas engineer, as arbitrator. Messrs. Cutler, in October, 1868, entered into an agreement with the Redhill Gas Company to construct on the company's premises a cast-iron tank and gas-holder. The contractors also agreed to construct the foundation; but on making the excavation they discovered that the subsoil was boggy and totally incapable of bearing the weight of the structure it would have to support. They reported this fact to the company, and requested them to provide another site for the gasholder. The company at first refused to do this, but on Messrs. Cutler stating their inability to carry out the contract on that site with credit to themselves, some negotiations ensued between the parties, which resulted in the abandonment of the contract, so far as the foundation was concerned, the contractors allowing a certain sum from the original contract price. The company then, failing to procure another site, decided upon making a foundation on the boggy site themselves. For this purpose they employed the very man who had been Messrs Cutler's sub-contractor for the foundation, and at last a resting-place was made for the tank and gasholder. The Messrs. Cutler then commenced building; but they discovered that as the structure increased in weight, the foundation began to subside unequally. This subsidence caused a very unequal strain to be exercised upon the side of the tank, which was constructed of plates of iron bolted together, the unequal strain causing the plates to fracture. The fractured plates were taken out and fresh ones substituted for them; but the contractors discovered that the subsidence caused the tank to be out of the perpendicular, and also out of the circular. They state that they did all in their power to remedy these defects by cutting the plates to a different shape, and by altering the joint; but they found their efforts were of no avail, and therefore applied to the company for payment of the work done. The company refused to make this payment, on the ground that the works had not been done in a proper manner, and that it was absolutely impossible for the gasholder to work in the tank as constructed by the contractors; whereupon the latter contended that as the badness of their work had been caused by the subsidence of the foundation constructed by the company, they were not liable to make their work good, and they gave notice of their intention to refer the matter to arbitration. Four days were employed in hearing evidence and speeches on both sides; and the arbitrator has decided that the Messrs. Cutler shall be paid the amount of their claim,—less only a few deductions for goods supplied by them to the company without written authority for them to do so. The latter part of the award condemns each party to pay their own costs, which, in all probability, amount to between 400*l.* and 500*l.*

THE PUBLIC CLOCK THAT STRUCK THIRTEEN AT MIDNIGHT.

MOST people have heard something about the tradition, that a soldier, whilst on guard at Windsor Castle, during the reign of William III., declared that he heard the clock of St. Paul's Cathedral strike thirteen at midnight.

Here is the original story — not generally known—which I take from *The Public Advertiser* of Friday, June 22, 1770, now before me :—

"Mr. John Hatfield, who died last Monday at his house in Glassbouse-yard, Aldersgate, aged 102, was a soldier in the reign of William and Mary, and the person who was tried and condemned by a court-martial for falling asleep on his duty upon the Terrace at Windsor. He absolutely denied the charge against him, and solemnly declared that he heard St. Paul's clock strike thirteen, the truth of which was much doubted by the Court, because of the great distance. But, whilst he was under sentence of death, affidavit was made by several persons that the clock actually did strike thirteen instead of twelve; whereupon he received his Majesty's pardon. The above his friends caused to be engraved on his plate, to satisfy the world of the truth of a story which had been much doubted, though he had often confirmed it to many gentlemen, and, a few days before his death, told it to several of his neighbours. He enjoyed his sight and memory to the day of his death."

But, as I stated in the *Builder* of December 14, 1867—when I gave my first account of the Great Bell—the sentinel must have spoken of the clock that struck upon "Great Tom at Westminster," for St. Paul's Cathedral had not then any public clock.

Your esteemed correspondent, "J. D. P.," having reopened the subject in your last number, I have thus attempted once more to set the question at rest. THOMAS WALESBY.

Chemical Professorship at Anderson's University, Glasgow. — Mr. James Young, well known in connexion with the paraffine industry, has presented 10,000 guineas to Anderson's University, for the purpose of founding a chair of technical chemistry, and establishing bursaries, scholarships, &c. The Society of Arts' *Journal* says Mr. W. H. Perkin, F.R.S., who, it will be remembered, delivered a course of Cantor lectures before the members of the Society of Arts during the last session, has been appointed the first professor.

NATIONAL EDUCATION LEAGUE.

A GENERAL meeting of the members of the National Education League is to be held at the Exchange Assembly-rooms, Birmingham, on Tuesday and Wednesday, the 12th and 13th of October. On Tuesday, after the election of officers, and the report of the Provisional Committee has been read, the following motion will be submitted to the meeting:—"Resolved, that a Bill, embodying the principles of the League, be prepared for introduction into Parliament early next Session." In the afternoon papers will be read and discussions taken on the best system for National Schools, based upon local rates and Government grants. In the evening there will be a *soirée* in the Town-hall, given by the Mayor of Birmingham. On Wednesday papers will be read and discussed on Compulsory Attendance, and on the best means of enforcing it; and on Unsectarian and Free Schools. In the evening a public meeting will be held in the Town-hall; the Mayor in the chair. Mr. F. Adams, 47, Ann-street, Birmingham, is the secretary.

The object of the League is the establishment of a system which shall secure the education of every child in England and Wales. The means proposed are :—

"1. Local authorities shall be compelled by law to see that sufficient school accommodation is provided for every child in their district.

2. The cost of founding and maintaining such schools as may be required shall be provided out of local rates supplemented by Government grants.

3. All schools aided by local rates shall be under the management of local authorities and subject to Government inspection.

4. All schools aided by local rates shall be unsectarian.

5. To all schools aided by local rates admission shall be free.

6. School accommodation being provided, the State or the local authorities shall have power to compel the attendance of children of suitable age not otherwise receiving education."

NEW ZEALAND.

The Illustrated Australian News, of Melbourne, gives a view and some particulars as to Princes-street, Dunedin. This street is the main thoroughfare of Dunedin, skirting the bay at the foot of the hills, on which the larger portion of the town is situated. The ground occupied by Princes-street has been levelled within the last few years, and now presents a very different appearance from what it did eight years ago, before the influx of a Victorian population. At that time it ran over two outlying spurs of the main range and crossed two swamps, one at the foot of Rattray-street, and the other further east, where the Octagon is now built. The view given is from the top of Jetty-street, and the first building on the right is the Provincial Chambers. The Provincial Government invited competitive designs for the Provincial buildings, and about eight sets of drawings were submitted. Those prepared by Messrs. Mason & Clayton were selected. The building is nearly square, having about 150 ft. frontage to both Princes and Water streets. The approach to the Provincial offices is from Princes-street. The offices surround a large central hall, which is approached from the main entrance in Princes-street; it is about 80 ft. by 40 ft., and both stories are lighted by a lantern from the top. This hall accommodates the public on the plan of a large bank, where easy access to each department may be had. The frontage to Bond-street has three stories on the ground floor, having two magistrates' courts, each 40 ft. by 25 ft., with the necessary offices conveniently arranged. Over these courts the Provincial Council Hall is situated (80 ft. by 34 ft. and 24 ft. high) fitted up for Mr. Speaker, members, reporters, and the public, with polished cedar.

The building is Italian, being faced with red pressed bricks, with Oamaru stone dressings. Next is the post-office. This building was commenced at the time when the demand for postal accommodation was very great, consequent upon the discovery of gold. Now that the great rushes are over it is found too large for postal purposes, and an arrangement has been entered into between the General and Provincial Governments by which the former hand the building over to the latter, on the condition that the Provincial Government provide funds sufficient to erect a smaller building suited to the requirements of post-office, telegraph, and registrar's departments. The principal front is towards Princes-street, about 150 ft., having a deeply recessed arcade on each side of a large central tower abutting at each end on wings, which were intended to have been offices for money orders, savings-bank, and private letter-boxes. The sorting-room, 60 ft. by 40 ft., is in the centre of the building, and off it are rooms for the letter carriers, inland and foreign despatch, delivery and receiving of letters; the sorting-room being lighted from the roof. The upper floor, which extends completely round the sorting-room, was planned to accommodate the chief postmaster, chief clerk, auditor, &c., but is now appropriated to the museum and municipal corporation offices. The building is faced with Oamaru stone, and otherwise built of brick. It is Italian in design, of rather an ornate character. The lower story is composite, with rusticated pilasters between dwarf Doric columns, supporting moulded arches, with enriched spandrels and richly carved frieze and cornice over. The upper story is Corinthian, the entablature, with the usual dentils and modillions, being supported by full columns, coupled with relieved windows between each pair of columns. The building was designed and carried out under the superintendence of Messrs. Mason & Clayton, at a total cost of about 28,000*l.* Beyond is the Bank of New Zealand. The spire in the central distance is the monument erected to the memory of Captain Cargill, the pioneer of the settlement built in the centre of the Octagon.

THE NEW STREET FROM BLACKFRIARS BRIDGE TO THE MANSION HOUSE.

SIR,—This street is only partly open. On the 9th of April last, the Metropolitan Board of Works let the contract for paving, sewering, sub-waying, &c., the Mansion House end of the street, a portion 450 yards in length, to Messrs. J. Mowlem & Co., for the sum of 19,750*l.*, and those gentlemen will probably finish their work during the ensuing month, October.

The Blackfriars Bridge end of the street (Blackfriars Bridge to near Cannon-street) must be at least a year before it is opened. Very little structural work has been done at this end.

The contract for the portion of the low-level sewer from *New* Earl-street to the Tower, about 1,480 yards in length, was let on May 14th, to Mr. Webster for 67,500*l.* This is the work which may be seen going on in New Earl-street, and in Cannon-street. The time to be occupied in this contract I have not heard.

The contract for that portion of the Northern Embankment which reaches eastward from the Temple Gardens, was let in May, 1868, to Mr. Webster, for 126,500*l.* It was commenced on June 30, 1868, and was to have been finished by June 30, 1869, that is, in twelve months from commencement, but some delay to the contractor was caused first by the whole land necessary not being placed at his disposal; and, secondly, by his dam breaking in. The progress up to June 1st this year was 48,490*l.*, of which the sum of 7,490*l.* was for progress during the month of May. The *average* progress, according to contract, was to have been 10,000*l.* a month. On the 24th of September the Board will meet again, and on the 1st of October we shall have another report of progress.

JASPER.

MONUMENTAL.

THE equestrian statue of the Queen, for Liverpool, now being completed by Mr. Thorneycroft, is not likely to be placed in its position in front of St. George's Hall during the present mayoralty. It will probably be about the Christmas or New Year holidays ere it is ready to be publicly unveiled.

A marble cenotaph, to the memory of the late distinguished astronomer, the Earl of Rosse, has just been erected in the church at Parsonstown, Ireland.

A new reredos, the gift of Lady Mildred and Mr. Beresford Hope, in memory of a daughter, and as a thank-offering for the recovery from a dangerous illness of another daughter, has been erected in Kilndown Church. It was carved by Mr. Redfern, under the general architectural superintendence of Mr. Slater, and was erected by the authority of a faculty from the Archbishop of Canterbury. The material is Painswick stone, relieved with colour and gilding. The shape is that of an oblong panel of the same length as the altar, and of such a height as not to interfere with the east window. The centre is occupied with the Crucifixion, angels appearing in attendance on our Lord.

The Humboldt centenary was celebrated throughout America. Some alarm seems to

have been excited lest the statue of the great traveller, which had been cast in Germany, should not arrive in time to be duly inaugurated. We learn, however, that it reached New York some days before the celebration.

THICK TRACING-PAPER.

SIR,—I require to make a number of tracings on thick tracing-paper, and shall be glad if any of your subscribers will inform me if there is any method by which the tracing-paper can be made more transparent, so that the ink lines can be plainly seen through the paper.

SURVEYOR.

*** A recipe for making thick paper transparent was quoted in our pages a few weeks ago.

DISFIGURING ADVERTISEMENTS.

Do you not think that the advertising portion of the community should be required to confine the exhibition of its talent within reasonable limits, and not be permitted to disfigure such portions of the metropolis as have been beautified at great public expense?

Not content with the innumerable spaces and contrivances already under their control, the advertisers must bedaub with their announcements every new piece of foot pavement, and completely spoil the appearance of new and well-finished work. The Thames Embankment is already disfigured in this way. The new street from the Mansion-house to Blackfriars has been in like manner visited by advertising transgressors; and, unless prevented, we shall be having the new Blackfriars Bridge and the Holborn Viaduct tattooed with fantastic advertising designs, much to the annoyance of every lover of order.

Why spend thousands of pounds upon stone carving and decorative ironwork, and then allow the effects to be counteracted by such unsightly additions as I have referred to? F. W. M.

Another correspondent writing on the want in the metropolis, still insufficiently met, of "stopping places" and the disfigurement of those there are, says:—

"I should like to draw the attention of the several vestries of London to a very effectual remedy adopted by that of St. Marylebone to prevent the places I have been writing about being made so unsightly by quack medical advertisements. I do not know the precise Act of Parliament quoted, but it is to this effect:—By a certain Act of Parliament named, any one disfiguring any lamp-post, or erection, or building in the parish, renders himself liable to a penalty not exceeding, &c., or an alternative of imprisonment."

CHURCH-BUILDING NEWS.

Shute (*Devon*).—The church at Shute has been re-opened, after considerable works of restoration. The central tower has had a new roof, parapets, and gurgoyles; and a new roof of red deal to the north aisle. The arched ceilings have been improved by ribs and bosses. The church has been reseated with red deal. A new vestry has been erected at the end of the north transept. The south transept arch has been opened and restored. Tracery and appropriate glass have been supplied to the west and transept windows. The east window is in stained glass by Messrs. Powell. There are a new pulpit and reredos, of Caen stone, with Ogwell marble shafts by Messrs. Mitchell & Son. Minton's tiles are laid in the chancel. The contractors were Messrs. Langford & Board. The stone carving was executed by Mr. Hems; the wood carving by Mr. Lindell and Mr. Harding, Exeter. The architect was Mr. Edward Ashworth, of Exeter.

Flockton.—The new church of St. James's, Flockton, near Wakefield, has been consecrated by the Bishop of Ripon. The foundation-stone of the new church was laid in 1867. Built in the Second Pointed style of architecture, the church contains nave, north aisle, chancel, chancel aisle, and south porch. It is seated to accommodate 450 persons, and the pews, which are all free, are of heavy pitch pine. Exteriorly the church is built of stone, and the inside walls are of pressed bricks, which, with the open-timbered roof and complete absence of ornamental masonry, give the building a very plain and unpretentious appearance. At the east end there is a stained-glass window, the gift of the children of the late Lady Matilda Lister Kaye, of Denby Grange, and the workmanship of Mr. Bagaley, of Newcastle-on-Tyne. The subjects of the first light are the Nativity, and Christ blessing little children; second light—Christ being made known in the breaking of Bread; centre light—the Crucifixion; fourth light—the Burial of Christ, and His Commission to His Apostles, the Resurrection, and the Martyrdom of St. James, to whom the church has been dedicated. In the tracery are represented the Ascension, and the Kingdom of Glory with the Angels. The nave is separated from the north aisle by four pointed arches of red brick, springing from circular stone pillars, with moulded capitals. The chancel is divided from the nave, with which it corresponds in width, by an arch of similar construction. On the west side of the church is a four-light tracery window, of plain glass, with stone mullions. At this end of the church a bell-turret has been erected, but there is no nearer approach to a tower, the church being exteriorly as plain as it appears inside. In the chancel aisle, which is separated from the church by a red-brick arch, is placed the organ which belonged to the old church. The building is entered by a porch at its south-west corner, with moulded doorway, and faced internally with white brick. The stone font, which is placed opposite the entrance, has likewise been removed from the old church. The chancel is paved with encaustic tiles, which are further carried up to the Communion-table. The church is built from the designs of Mr. W. H. Crossland, of Leeds and London, and is built on land bequeathed for the purpose by the late Rev. H. Torre, rector of Thornhill, who has also furnished the burial-ground adjoining. The cost of erection will be about 2,600*l.*; of this amount 2,000*l.* have already been subscribed.

Carlton.—The church of Carlton, Saxmundham, has been restored. The restoration just finished has been entirely confined to the interior of the building, which has undergone a complete transformation. Formerly the nave was filled with high pews, the chancel was on the same level as the nave, and the carved oak pulpit was stuck upon a kind of platform in the south-east corner of the nave. Now the floor of the nave has been re-laid, the passage paved, and in the place of the old pews are stained deal benches with carved poppy-heads, the oak panelling round the walls being allowed to remain. The vestry under the tower has been re-arranged and improved, and the pulpit removed from the south to the north side of the nave, and placed upon a base designed by Mr. T. Thurlow, of Saxmundham (by whom the restoration of the chancel has been carried out, and who has had the general superintendence of the whole), and where necessary it has been retouched. The chancel arch remains as it was before, but the floor of the chancel has been raised a step above that of the nave, and a plain stone screen put up with new reading-desk and lectern. The carved oak benches in the chancel have been repaired and re-arranged by Mr. Thurlow, and its floor is now paved with Staffordshire tiles, the space within the communion-rails being paved with Minton's unglazed encaustic tiles. Mr. Carter, of Saxmundham, has carried out the carpenter's work. The restoration of the chancel has been at the expense of the rector, the cost of that of the nave being defrayed by subscriptions.

Longhope.—The spire and tower of the parish church having been for some time past in a dangerous and dilapidated condition, it has been determined to take down the spire and part of the tower, and to rebuild the latter in a more substantial manner. The tower will have pinnacles at the angles, and the bells, so long silent, will be rehung and made available for ringing. The contract has been let to Mr. Organ, of Mitcheldean, builder; and the works will be carried on under the direction and superintendence of Mr. Alfred W. Maberly, of Gloucester, architect.

Winshill, near Burton.—St. Mark's Church, Winshill, near Burton-upon-Trent, has been consecrated. Mr. Holmes was the architect. The church is in the Geometrical Early Decorated style of architecture, and comprises nave, 72 ft. long by 24 ft. wide within the columns; north and south aisle, each 12 ft. wide—the tower occupying the west end bay of the south aisle; the chancel, 30 ft. long by 21 ft. wide, and a vestry and organ-chamber on the north side of the chancel. On the north, an arcading of four bays, and one on the south of three bays, connect the aisles with the body of the church. The arches are of Hollington stone, with red Mansfield stone voussoirs, and have an inner ring of Bath stone, chamfered. They are supported by square shafts, diagonal in plan to the line of arcading, with a red Mansfield stone column on each face, and connected together with richly-carved caps and moulded strings and bases. Alabaster is employed in the ornamentation of these columns. The entrances to the church are situated west and south, the latter occupying the lower stage of the tower, and the former entering through a porch, with stone roof and ceiling. The doorways are relieved by red Mansfield stone shafts, with moulded bases and carved caps, and the arches are moulded. The height from the floor to the ridge of the nave roof is 52 ft., and from the floor to the top of the wall-plate 22 ft. The nave and aisle roofs are open-timbered, and plastered between the rafters; that of the nave is carried by framed principals, with king-posts and tie-beams moulded and carved, and supported on stone corbels. The chancel roof is carried by framed principals with curved trusses, supported by Devonshire marble corbelled shafts, with carved caps and corbels. This roof is boarded on the under side of the rafters, the upper portion taking the form of the cross-braces of the principals. The tower is 65 ft. high, and the spire 75 ft. to the top of the cap-stone, the total height to the top of the vane being 150 ft. The tower contains a peal of six bells, from the foundry of Mr. John Taylor, of Loughborough. The bell-framing, which is of oak, is carried by stone corbels built into the tower walls. The diameter of the tenor bell across the mouth is 47½ in. The walls of the building are of brick, plastered internally, and faced externally with Hollington stone, the external dressings and moulded and carved work being of picked Hollington stone, rubbed. The internal dressings are of Bath stone. Red Mansfield stone has been used in the bands and voussoirs of the arches. The roofs are covered with tiles of two colours, arranged in patterns, and having an ornamented ridge cresting. The interior of the chancel is lined with Bath stone. The opening to the chancel is 20 ft. wide between the piers, and the height from the floor of the nave to the apex of the arch is 32 ft. Four Devonshire marble shafts, with moulded bases and carved bands and caps, support the arch, the inner rim of which is of Derbyshire alabaster. The building is lighted by a wheel-window at the west end, and by several three-light windows with traceried heads in the aisles. The chancel is lighted by two single-light windows on the south side, and one on the north side, and a beautiful seven-light east window, the latter being filled with stained glass, representing various incidents in the life of the Saviour. It will seat about 550 persons. The reredos (of Caen stone) extends across the whole width of the chancel, and consists of an arcading of seven divisions, the centre being considerably larger than the others. The arches, which are moulded and cusped, are carried by dwarf alabaster shafts, with moulded bases and carved caps. Over the arches are gables with carved crockets and finials, the space forming the tympanum being filled in with sunk tracery. In the spandrel spaces between each gable are figures of angels, supported by carved corbels, and covered by carved canopies; the seven compartments are filled in with polished white marble, that in the centre having the sacred monogram in brass, whilst the other compartments contain the Commandments, Belief, and Lord's Prayer, and selected text. The lower part of the reredos has the surface carved in diaper. The nave and aisle benches are of deal, stained and varnished. The chancel stalls are worked in oak, having open-framed arcaded fronts, the spandrels of trefoil heads, and other portions being carved. The chancel floor is laid with Minton's encaustic tiles, while the aisles and passages in the nave are laid with Hopton Wood stone. The church is warmed by means of hot water. At the entrance to the churchyard are folding gates to the carriage-road, with foot-gates on either side hung to stone piers, The gates are framed and cross-traced with oak, and fitted in with ornamental metal work. This, and the metal work in the chancel and pulpit-rails, was the work of Messrs. C. Smith & Son, of Birmingham. The stone work has been executed by Mr. William Clarke, of Burton-on-Trent, and the joiner's work by Mr. George Lilley, of Ashby-de-la-Zouch; the carving throughout has been cut by Mr. Thompson, of Nottingham.

Bungay.—The alterations and improvements in the interior of St. Mary's Church being sufficiently completed, a special opening has

taken place. Among the improvements in the church we may notice the erection of a stone reredos, consisting of traceried base, Gothic arches with carved spandrels and surmounted with carved cresting; an oak altar-table, carved; new oak altar-rails on metal standards, &c. Within the altar-rails the floor is laid with Minton's encaustic tiles. The reredos was executed by Mr. Henry Nursey, and the altar-table and reading-desk by Mr. J. D. Botwright, both of this town.

SCHOOL-BUILDING NEWS.

Percy (*Tynemouth*).—The foundation-stone of new schools for the parish of Percy, in the township of Tynemouth, has been laid by his Grace the Duke of Northumberland, who has also given the site. The schools are intended for the accommodation of 129 boys and 96 girls; a house containing five rooms being also provided for the schoolmaster. The cost of the building will be 1,050*l.*, exclusive of the value of a large quantity of materials which have been supplied by the neighbouring proprietors. The building will be erected from the designs of Messrs. Green & Gibson, architects, Newcastle-on-Tyne.

Kidderminster.—New Wesleyan schools have been erected and opened here. Mr. Bland, of Birmingham, prepared the plans, and the building has been erected by Mr. Hodgkiss, of Wolverley, the cost being about 1,150*l.*, exclusive of fittings. The new schools consist of one large room, another room for infants, and four class-rooms.

Books Received.

Architectural and Decorative Designs, for the Use of those engaged in Architecture, Sculpture, Working in Metals, &c. Drawn by Enrico Salandri. Incorporated with "Page's Decorator." London: Atchley & Co. 1869.

WE have here sixty-five quarto plates of parts of buildings, ornaments, and details well drawn and neatly engraved, for a price little more than nominal,—12s. 6d. They are, for the most part, from works of the Renaissance period, not a few Rococo, and the plates have done duty before: nevertheless we venture to say there are few persons engaged in designing who would not find the volume a good investment.

Miscellanea.

The Carlisle Memorial.—A column in memory of the late Earl of Carlisle, erected on the summit of Balmer-hill, Castle Howard, Yorkshire, was last week opened to view. The design by Mr. F. P. Cockerell was selected, our readers may remember, in competition. The work has been executed by Mr. Bailey, of York, under the honorary clerkship of Mr. John Check, of Whitwell, the agent for the Lechmere estates. The monument bears a surrounding inscription, as follows:—"In memory of George Wm. Frederick VIIth Earl of Carlisle, Viscount Morpeth, K.G." Upon the Castle Howard face of the pedestal is the inscription, "He to whom this monument was raised, A.D. MDCCCLXIX., in private life was loved by all who knew him. By his public conduct he won the respect of his country, and left the bright example of a true patriot and earnest Christian." On the York face is the following:—"He to whom this monument was raised by public subscription, during XII. years represented in the House of Commons firstly Yorkshire, secondly the West Riding, and during VIII. years was Viceroy of Ireland." The cost is estimated at over 2,000*l.* The monument is visible to the whole vale of York, the greater part of the vale of Derwent, the West Riding hills, the Yorkshire wolds, and a large part of the North Riding.

Government Educational Inquiry in Manchester.—In preparation for the bill for the improvement of the education of the people, which is to be submitted next session to Parliament, the Government is making an inquiry into the present supply and quality of such education within the municipal boroughs of Manchester and Liverpool. The commissioner, Mr. D. R. Fearon, who is appointed to conduct the inquiry in these two boroughs, will commence his operations in Manchester about the 20th of November, and in the meantime receive information or suggestions from persons interested in the subject.

Railway Progress in Russia.—The table of Russian railway statistics for 1870 has just issued from the press. The railways already in operation make up an aggregate of 5,400 English miles, all of which, with the exception of the Moscow, Tsarskoe-Celo, Riga-Dunaburg, and Warsaw-Vienna lines, have been constructed within the last eight years. The lines to be opened in 1870 are the Kharkov-Taganrog, 350 miles; the St. Petersburg-Viborg, 240 miles; the Moscow-Smolensk, 260 miles; the Ribinsk-Bologoe, 172 miles; the Lazovo-Sevastopol, 400 miles; and the Ostashkovo-Torjkovsk, 21 miles. To be opened in 1871, the Poti-Tiflis, 190 miles; the Kharkov-Krementchug, 165 miles; the Voronej-Grushevk, 353 miles; the Libau, 196 miles; the Ivanovo-Kineshansk, 248 miles; and the Skopinsk-Riajsk, 29 miles. To be opened in 1872, the Baltic-Port and St. Petersburg, 254 miles; the Tambov-Saratov, 225 miles; and the Borisoglaibsk-Tsaritzin, 232 miles; the whole forming a total of 3,335 miles of railway to be completed and set in operation within the next three years. The programme of the "outer list" contains the lines surveyed during the past year, and now about to be commenced. These reach the enormous aggregate of 10,000 English miles, and run thus:—Southern and Western lines:—1. From Smolensk to Brest-Litovsk; 2. From Rostov (on the Don) to the central Caucasus; 3. From Livna to Orel. Eastern lines:—1. From Tiflis (the chief town of the Caucasus) to Baku, on the Caspian Sea; 2. From Nijni-Novgorod (*viâ* Kazan) to Ekaterinburg, the frontier town of Siberia; 3. From Morshansk (*viâ* Penza and Samara-super-Volga) to Orenburg, the frontier town of Tartary. Northern lines:—1. From Yaroslavl or Ribinsk to Vologda; 2. From Viatka (a town about 300 miles to the north-east of Nijni-Novgorod) to Archangelsk.

The Artisans' and Labourers' Dwellings Act.—Two of the parochial bodies of the metropolis have at last begun to act up to the spirit and letter of Mr. Torrens's Act. At a recent meeting of the Hackney District Board of Works, Mr. Runtz moved that the houses in Laurence-buildings, West Hackney, numbered 1 to 6, and 8 to 11 inclusive, be closed. He remarked that the Board had tried every means of bringing the premises into a habitable condition, but without effect. Fever, he said, was continually in the place, and to close up the houses was the only practical remedy to be adopted. Mr. Beck said he had known the place for the last twenty-five years as a hot-bed of disease. Mr. Gowland hoped this case might act as a caution to other landlords as to the state of repair in which they kept their houses. The motion was carried, as was also another for the demolition of a number of cottages in Sanford-lane, West Hackney. At the last meeting of the vestry of St. George the Martyr, Southwark, it was decided that the necessary proceedings should be taken in the case of certain houses in Little Surrey-street, which had been reported by the medical officer as unfit for human habitation and dangerous to health.

To Render Timber Incombustible.—In the *Neues Jahrbuch für Pharmacie*, Herr Reinsch states that, having been requested to report to a fire insurance company about the best means of preventing timber bursting into flame, he experimented with various salts, and at last came to the conclusion, as the result of his experiments, that impregnating timber with a concentrated solution of rock-salt is as good, if not better, a preservative against its bursting into flame as water-glass (silicate of soda), while the price of the former salt is, of course, only a mere trifle; moreover, rock-salt thus applied to timber is a preservative against dry rot and noxious insects. The author recommends the use of salt water, that is to say, a solution of rock-salt of moderate strength for the use of fire-engines during a fire as by far more effective than water; but in order that the salt should not injure the working parts of the engines, they will immediately afterwards have to be played with fresh water again.

Architecture, University College.—We desire to draw attention to the commencement of the annual course of lectures at University College by Professor Hayter Lewis. The first lecture will be given on Tuesday, October 5th. There will be thirty lectures on architecture as a fine art, and thirty on construction. Students will do well to avail themselves of the means of obtaining information thus afforded. The lectures are delivered in the evening.

Invention for Supplying a City with Hot Air.—Experiments, it seems, are being made by a gentleman who has worked for many years in the United States armoury, for supplying a city with heated air. He proposes to force air rapidly through a coil or series of iron pipes heated in a furnace, and then to a greater length of pipe outside, made of fire-clay, which is claimed to be about the best non-conductor that can be had. The first trial will be a pump of 8 in. diameter and 8 in. stroke, and the clay pipes, now being made in New York, will be 300 ft. in length and of a 4 in. bore, with a thermometer at each end, which will indicate 600 degrees. The projector expects to heat the air in the iron pipe to that temperature and force it to the further end with little loss. If the pipes are laid in the streets it will be necessary to have them enclosed in a brick arch, lined with mortar made of fire-clay. It is contended, if the thing works according to the expectation of the projector, that but a small portion of the coal now used will be necessary for all heating and cooking purposes.

A Sanitary Inspector Wanted.—Any one walking through the pleasant green fields between Highgate and Fortis-green will have his nostrils assailed by the most abominable odour, arising from an open ditch, passing beneath the high road and Great Northern Railway, and winding towards Finchley. On tracing this open drain to its source, we found it in a field through which a public footpath runs at the back of Hampstead-lane, and close to a crescent of new and, at present, unoccupied villas, in which the odour was distinctly perceptible. Here the open mouth of a large earthenware drain empties its contents, which are said to be *only* the overflow of some large cesspools receiving the drainage of the houses on the north-west side of Highgate. However this may be, it is certain that the new houses in the crescent, at the back of the playing fields of the Cholmeley School, have lately been drained into this open ditch, and that its stench is abominable. The drains of many of the houses of Fortis-green also run into this ditch, and no attempt has been made to cover it in.—*Lancet*.

Grange-over-Sands, North Lancashire. The Blawith Estate, advertised in our present issue for sale on the 14th of October, is in a peculiarly beautiful, though not very well known, part of the country. Grange overlooks Morecambe Bay, and, knowing the site well, we quite agree with a contemporary, who says:—Excursionists in want of a new pleasure,—they who have done Europe, and are shy of Ireland, not caring to be shot by the merest mistake in the south, or stoned for being too blue, or too orange, or too green, in the north,—will do well to take tickets for Grange, and explore the magnificent district. Beauty of nature, interest of history, quaintness of social life, and many other pleasant things, combine to make the place attractive. The estate includes a good mansion, and a very productive farm. An hotel has been built, and the railway station adjoins the grounds, and gives ready communication with Furness Abbey, Lake Coniston, and Barrow.

Nicknames of Italian Painters.—Adolf Stahr, in his "Winter in Rome" (*Ein Winter in Rom*, von Adolf Stahr und Fanny Lewald, Berlin, 1869), writes:—

"Together with Guercino's name I remember that this, too, is a nickname, Guercino meaning 'the little squint': his original family name was Barbieri. Such like *soprannomi* which, originally given by boon companions, stuck to the artist, and took the place of the true name of the same, are many in the history of Italian art, and they are at the same time characteristic as regards the social forms of that time. Thus the painter Robusti was, and is still, called 'Tintoretto' (the little dyer); Barbarelli we know almost only as 'Giorgione' (fat George); Conradi as 'Ghirlandajo' (the garland-maker); Ribera as 'the little Spaniard' (Spagnoletto); Andrea Vanucchi is much better known by his nickname Andrea del Sarto (Tailor's Andreas), his father being a tailor. Which name is hid behind Luca della Robbia ('Madder-Luke'), and Masaccio ('Dirt-Thomas'), I cannot call to mind just now."

Kenilworth Castle.—A considerable portion of the ruins of this once magnificent pile having shown signs of falling, Earl Clarendon, the owner, is now repairing and strengthening the great hall, Leicester's buildings, and parts of the external walls on either side. His lordship is also restoring some of the doorways, windows, and fireplaces. In the course of the repairs excavations have been made, and underground apartments, cells, and passages revealed which had been hid for centuries. The great hall, 90ft. by 45 ft., still retains several of its Gothic windows, and some of the towers yet rise 70 ft. high.

Royal Military College, Sandhurst.—A memorial window to the late gentleman cadet George Ayscough Booth, son of the vicar of Clandown, Bath, has recently been erected in the east end of the College Chapel. The stonework, of the fifteenth century, was designed by Mr. Buckeridge, of London. It is a cusped four-light window with tracery. The two side-light windows bear a series of subjects in stained glass, commemoratively displaying, under the form of allegory, the virtues of Bravery, Piety, Brotherly Love, and Resignation; while the Redemption, Resurrection, Ascension, and Judgment are embraced in the centre compartments. Faith, Hope and Charity, Humility, Forgiving Spirit, and Repentance are also allegorically displayed in the tracery, and two ascending angels bearing texts, complete the figurative arrangement. The entire work is finished by a canopy-work surmounting each group. The window was executed by Messrs. R. B. Edmundson & Son, Manchester.

A Mushroom Town.—The headlong manner in which things are done at the West is shown by the progress of the town of Duluth, upon the projected route of the Northern Pacific Railroad, and which metropolis is now fully three months old. Within the period which has elapsed since its birth, 75 houses have been built, plank sidewalks laid down, a large hotel commenced, which will be completed in September, and two churches are under way. Four months ago the land upon which Duluth is to be built was worth from 1 dol. 25 c. to 2 dols. 50 c. per acre; now town lots in the city are worth 1,000 dols. each. From about five persons—the population of Duluth on the 1st of April—the residents of the town have swelled to 1,500.—*Philadelphia Commercial.*

Leith School of Art.—At a meeting held in the Council Chambers, Leith,—the Provost in the chair,—it was resolved to establish in Leith a School of Art, in connexion with the Government Department of Science and Art, for giving instruction in freehand, geometrical, mechanical, and architectural drawing, designing for manufactures, modelling, and painting. Over 50*l.* had been already subscribed, and some further sums promised, to meet the expenses incurred in commencing the school. An influential local committee was formed, with the Provost as chairman, and Mr. Robert L. Bain, late art-master at Inverness, was appointed master of the school.

An "Unsuitable" Tombstone.—At a recent meeting of the Wednesbury Local Board, attention was called to a tombstone to the memory of a man named Mincher, lately erected in the cemetery, with Watts's verse inscribed upon it:—

> "Whatever brawls disturb the street,
> There should be peace at home:
> Where sisters dwell, and brothers meet,
> Quarrels should never come."

The verse was held to be unsuitable. The clerk said the verse was attached without the knowledge of the Board, and it could be removed. The chairman was not inclined to order the absolute removal of the stone, but merely to point out the objectionable verse to the friends, for them to alter it. The widow's defence was that the deceased often repeated the verse. The suggestion of the chairman was adopted, and it was resolved that in future all inscriptions should be submitted to the Board.

Breaking of a Bridge in Prussia.—At Konisberg, during a *fête* in honour of the King and Crown Prince of Prussia, the Princess of Wales, and other royal personages present at Konisberg, a wooden bridge which was illuminated seems to have caught fire, and a panic seized the people who were on it witnessing fireworks which were going on; the railing of the bridge gave way, and some hundred persons were precipitated into the Schloss teich or lake below. Forty-three corpses had been recovered by recent accounts. The *fête* was brought to a sudden close.

A Railway Bridge on Fire.—Early on Friday morning, Cottom railway bridge, about three miles from Preston, was discovered to be on fire on the up-line side of the bridge. The traffic on that line was at once stopped, and efforts were made to extinguish the fire, which fortunately were successful, and preparations were made to renew the burnt part of the bridge with fresh timber. The bridge is a wooden one, and it is supposed the fire was caused by lighted cinders falling from an engine in passing over.

Will of an Italian Architect.—Signor Poletti has left his whole fortune, now found to amount to 400,000 francs, to his native place, Modena. The syndic of that city, however, has just been apprised that the executors will not part with the property until Modena is placed in a position of independence, and that, in default of this—that is, the restoration of the old duchy of Modena—the bequest will be diverted to the city of Rome.

Park-lane: a Large Offer.—At the meeting of the Metropolitan Board of Works this Friday, a letter from Mr. Dunster is to be read, stating that one of his clients is willing, on the Board obtaining a repeal of the Act for opening up Hamilton-place, and obtaining an Act for the widening of Park-lane, to contribute the sum of 50,000*l.* towards such improvement.

Velasquez.—We hear that in one of the public libraries of Spain several letters and receipts in Velasquez's own handwriting have been found. One was a receipt for 1,100 reals, or nearly eleven pounds sterling, for his famous picture of "The Drunkards." Prices have changed.

The Builders' Benevolent Institution.—The annual dinner in aid of the funds of this charity is fixed to take place on Thursday, the 28th of October. Mr. J. M. Macey is the president for the year, and the list of stewards is now being made up.

Discovery in Rome.—In digging for the foundations of a large palace to be constructed for a savings-bank on the Piazza Sciarra in the Corso the workmen, it is said, lately discovered the basement of the triumphal arch erected by the Senate to the Emperor Claudius.

Dumfries.—The foundation-stone of a new infirmary for Dumfriesshire and New Galloway has been laid, with Masonic honours, by Mr. Lauderdale Maitland, Provincial Grand Master for Dumfries. The building is expected to cost about 13,000*l.*

The Gale.—During the recent high winds an old beech tree, nearly 4 ft. in diameter, was suddenly blown down at Croydon. The tree was borne by the gale across St. Peter's-road on to the roof of a house, which it greatly damaged.

Blackfriars Bridge.—This bridge was commenced in the year 1760, not 1710, as, by a typographical slip, was stated in a recent notice of Metropolitan bridges in our pages.

Eton College.—A new music-hall is being erected in connexion with Eton College. A residence is also being built for Doctor Hayne, the professor of music.

TENDERS.

For stabling at Holloway, for the London General Omnibus Company (Limited). Mr. A. G. Church, general manager. Mr. Scurry, architect. Quantities supplied:—

Fawcett	£14,355 0 0
Fletcher & Caughey	14,181 0 0
Williams & Sons	13,870 0 0
Sanders	13,500 0 0
Pearson	12,990 0 0
Clemence	12,987 0 0
Carter & Sons	12,750 0 0
Kelly, Brothers	12,734 0 0
Blackmore & Morley	12,690 0 0
Roberts & Co.	12,590 0 0
Lewis & Co.	12,499 19 8
Turner, W. T.	12,497 0 0
Hailey	12,493 12 10
Conder	12,482 0 0
Parker	12,440 0 0
Ford	12,399 0 0
Goodman	12,349 0 0
McLachlan	12,246 0 0
Brown	12,200 0 0
King & Sons	12,170 0 0
Coker	12,050 0 0
Henshaw	11,995 0 0
Stoner	11,979 0 0
Hill, Keddell, & Waldram	11,955 0 0
Merritt & Ashby	11,955 0 0
Manley & Rogers	11,920 0 0
Tavener	11,894 16 0
Scrivener & White	11,848 0 0
Higgs	11,833 0 0
Thomas & Son	11,747 0 0
Crabb & Vaughan	11,745 0 0
Eaton & Chapman	11,600 0 0
Winship	11,590 0 0
Crockett	11,500 0 0
Turner, J. P.	11,475 0 0
Perry	11,447 0 0
Cooke & Green	11,237 0 0
Till	11,187 0 0
Hughesdon	11,100 0 0
Tripp & Co.	10,575 0 0
Snowball	10,438 0 0
Langmead & Way (accepted)	10,395 0 0

For alterations to residence, Talk-oth-Hill, for Mr. Thos. Sherratt. Mr. G. B. Ford, architect, Burslem:—

Fryer (accepted)	£310 0 0

For alterations to the Wesleyan Chapel, Burslem. Mr. G. B. Ford, architect:—

Blackhurst	£300 0 0
Woolrich	300 0 0
Brindley & Critchlow	249 10 0
Glazing and Painting.	
Langley	105 0 0
Sambrook	94 0 0

For alteration of front and new workshops at rear of 25, Soho-square, for Messrs. G. & I. Allen. Mr. Ward, architect:—

Laing	£335 0 0
Tidy	278 0 0
Manley & Rogers	243 0 0
Belham	230 0 0
Slade	188 0 0

For rebuilding No. 83, Watling-street, and making sundry alterations and additions to warehouse, for Messrs. Crocker, Sons, & Turner. Mr. Herbert Ford, architect:—

Pritchard	£3,406 0 0
Browne & Robinson	3,317 0 0
Henshaw	2,628 0 0
Ashby & Horner	2,465 0 0
Conder	2,389 0 0
Lawrence & Sons	2,339 0 0
Brass	2,185 0 0
Myers & Sons	2,096 0 0
Moultrie	2,088 0 0

For enlarging men's receiving ward, and building bakehouse, at the Faversham Union. Mr. B. Atkins, architect:—

Whiting	£540 0 0
Bourne	504 16 0
Shrubsole	497 0 0
Ratcliffe	478 10 0
Austen	473 0 0
Judges (accepted)	469 0 0

For alterations, additions, and repairs, at Nos. 52 & 53, Sloane-street, Chelsea, for Mr. Elton. Mr. Sidney Godwin, architect:—

Grover	£475 0 0
Fletcher & Caughey	428 0 0
Bowman	417 0 0
Jones	364 10 0
Robinson	357 0 0

For County Court of Kent, at Gravesend. Mr. T. C. Sorby, architect. Quantities supplied by Mr. J. Scott:—

Chappell	£8,248 0 0
Cobham	8,000 0 0
Patman & Co.	7,998 0 0
Browne & Robinson	7,869 0 0
Nixon & Son	7,846 0 0
Pink & Mitchell	7,670 0 0
Lilleystone	7,650 0 0
Macey	7,594 0 0
Lathey Brothers	7,473 0 0
Higgs	7,447 0 0
Blake	7,400 0 0
Hill & Sons	7,330 0 0

For the erection of a County Court-house at Barnsley. Mr. T. C. Sorby, architect. Quantities supplied by Mr. J. Scott:—

	Oak Joinery.
Latham & Son	£8,440 0 0 ... £8,500 0 0
Neill	8,010 0 0 ... 8,500 0 0
Hinchcliff & Son	8,100 0 0 ... 8,445 0 0
Tomlinson	7,934 0 0 ... 8,250 0 0
Ridal	7,887 0 0 ... 8,238 0 0
Neill & Sons	7,806 0 0 ... 8,166 0 0
Robinson & Son	7,530 0 0 ... 7,725 0 0
Shaftoe & Barry	7,367 0 0 ... 7,555 0 0
Beauland	7,290 0 0 ... 7,490 0 0
Boothman & Broomhead	7,026 0 0 ... 7,195 0 0
Nicholson & Son	6,993 0 0 ... 7,193 0 0
Taylor & Son	5,816 0 0 ... 6,056 0 0

For additions to The Willows, Mitcham. Mr. Joseph Gibson, architect:—

Cooper & Cullum	£598 0 0
McLachlan	549 0 0
Carter & Son (accepted)	499 0 0
Taylor	498 10 0

For building two dwelling-houses, Church-street, Blackfriars-road, for Mr. Isaacs. Mr. E. L. Blackburne, architect. Quantities supplied by Mr. Shrubsole:—

Merritt & Ashby	£1,471 0 0
Taylor & Pitts	1,460 0 0
Warne	1,375 0 0
Crabb & Vaughan	1,370 0 0
W. Smith	1,355 0 0
Gore	1,346 0 0
Nightingale	1,267 0 0
Pitcher	1,253 0 0
Soden	1,228 0 0
Cooke & Green	1,227 0 0
Brown & Sons	1,210 0 0
Till	1,209 0 0
Harvey	1,197 0 0
A. Smith	1,179 0 0
Hutchinson	1,150 0 0
Shirley & Horne	1,110 0 0
Stone	1,110 0 0
Cohen	1,100 0 0
Turner	1,085 0 0
Brown	1,047 0 0

For the erection of four houses at Acton, Middlesex, for Mr. J. Barnes. Mr. J. Figg, architect. Quantities by Mr. Shrubsole and Messrs. Maples:—

Bell	£1,450 0 0
Crabb & Vaughan	1,435 0 0
Kelly Brothers	1,373 0 0
Blackmore & Morley	1,365 0 0
Warner	1,330 0 0
Till	1,306 0 0
Turner	1,275 0 0
Rowles	1,230 0 0
Knight	1,221 0 0
Cawdron	997 0 0

For alterations to the Clock-house at Potter's Bar, the list of tenders for which was published last week:—

Shirley & Horne (accepted)	£308 0 0

For the erection of a Presbyterian church at Camberwell. Mr. S. C. Capes, architect. Quantities supplied by Mr. Lanadown :—

Thompson	£5,100	0	0
Nightingale	4,995	0	0
Newman & Mann	4,841	0	0
Dove Brothers	4,805	0	0
Webb & Sons	4,658	0	0
Scrivener & White	4,626	0	0
Colls & Son	4,587	0	0
Sawyer	4,585	0	0
Cooper & Cullum	4,564	0	0
Jackson & Shaw	4,524	0	0
Wells	4,195	0	0

For pulling down and rebuilding Bloomfield Hall, Berks, for Mr. T. Holloway. Mr. J. Dale, architect. Quantities supplied by Mr. Bennett :—

Revell	£11,995	0	0
Nightingale	11,473	0	0
Harris & Edwards	11,350	0	0
Till	11,200	0	0
Longmire & Burge	11,135	0	0
Cowland	10,990	0	0
Twelvetrees	10,515	0	0
Underwood	10,382	0	0
Elliott	9,800	0	0
Parsons	9,790	0	0
Woodbridge	9,571	0	0
Gibson Brothers	9,442	0	0
Pythers	9,355	0	0
Roberts & Co.	9,302	0	0
Collins	9,273	0	0
Carter & Sons	9,240	0	0
Nutt & Co.	9,136	0	0
Pearce Brothers	9,085	0	0
Mesher	8,960	0	0
Baxter	8,795	0	0

For Lilley's Mansion, Weedon, near Aylesbury, for Mr. H. Cazenove. Mr. G. Devey, architect :—

Trollope	£11,642	0	0
Holland	11,547	0	0
Haddon	11,159	0	0
Sewell	10,888	0	0
Durley	10,528	0	0
Myers	10,373	0	0

TO CORRESPONDENTS.

A. B. (the question of damp walls has been discussed on several occasions in our pages. Very little that is satisfactory has resulted).—H. (ditto).—Yarmouth (ditto).—Kensington News (we are by no means sure that the opposition to the proposed light is sound).—T. E. C. (nothing to be recommended with certainty).—P. W. B. (next week).—W. W.—E. P.—O. J.—F. W. M.—H. R.—W. C.—R. L. R.—W. S.—R. A.—G. L.—J. H. S.—Mrs. G. H.—L.—E. J. H. S.—A. D.—W. E.—J. G.—T. O.—E. L.—J. L. B.—Surveyor.—H. G.—H. L.—C. C. H.—T. C. S.—J. B.—G. R.—F. M.—P.—W. G. S.—J. W. W.—Mr H.—E. & Sons.—E. A. D.—T. & J. M.—The Lord of the Manor.—E. H., Truro.—S. S.—M. H. L.—J. C. L.—J. W. N.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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(Signed) J. M. DEAGO,
Treasurer of the National Government.
JOSE TOMAS ROJO.
JUAN M. ALVAREZ.

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EDWARD BROUGH SARGENT, Clerk to the Committee,
Union Offices, Edward-street, Woolwich, S.E.
18th September, 1869.

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